Factor Research Group

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SURVEY OF ATTENTION DEFICIT HYPERACTIVITY DISORDER (ADHD) DIAGNOSIS AND TREATMENT WITH METHYLPHENIDATE AMONG CANADIAN PHYSICIANS

FINAL REPORT

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Abstract

This study was undertaken by Health Canada to obtain feedback from Canadian physicians regarding the use of methylphenidate (MPH) in the treatment of Attention Deficit/Hyperactivity Disorder (ADHD). Overall, 636 physicians returned questionnaires, for a response rate of 20%. Physicians had a mean age of 45.6 years, 56% were male and 43% were female, most received their medical degrees within Canada (73%), had practised a mean of 17.5 years, and over half practised in either a group or solo private practice.

Some major findings were that 80% of physicians had at some time seen a patient diagnosed with ADHD, 84% of these had prescribed MPH, and 85% of these currently had patients on MPH. MPH was perceived by many as the treatment of choice for ADHD, particularly in a multi-modal course of treatment. Approximately 27% of physicians used MPH for the treatment of disorders other than ADHD or ADD. Sixty-six percent of patients currently being treated for ADHD were being treated with MPH.

Many physicians believe ADHD diagnosis needs improvement, that there are too few properly qualified diagnosticians, and that physicians generally are poorly informed about standard diagnostic criteria. Physicians most often prefer to diagnose and treat ADHD patients themselves, most often using standard diagnostic criteria or the DSM IV.

Most physicians believed that MPH use had increased in their experience. Most agreed that national increases were due to increased public awareness, pressure from parents and teachers, a lack of resources for other interventions, and increased acceptance of medication to treat ADHD. Teacher and parent concern were the main sources of patient referral.

Executive Summary

A survey was undertaken by Health Canada's Therapeutic Products Programme (TPP) to obtain feedback from Canadian physicians regarding the use of methylphenidate (MPH), available under the brand name Ritalin or other generic products, in the treatment of Attention Deficit/Hyperactivity Disorder (ADHD). According to Health Canada data and confirmed by other sources, the annual use of MPH has increased five fold between 1990 and 1997. The objective of the survey was to determine how Canadian physicians diagnose and treat ADHD, the conditions under which they prescribe MPH, as well as what pressures physicians may face in this context. This survey was undertaken to provide descriptive data on physician perceptions and opinions regarding the diagnosis of ADHD and its treatment with MPH and was not intended to establish objectively verifiable measures of behaviour or conditions.

Methodology

Survey packages, consisting of a cover letter, a questionnaire, a self-addressed postage-paid return envelope, and a return postcard were mailed in April, 1999. Telephone reminder calls were made two weeks later and were followed by a reminder notice mailed to all physicians who did not return a survey registration card.

An initial sample of 3,320 physicians was randomly selected. When invalid addresses were eliminated, a response rate of approximately 20% was obtained. The responses included 253 general practitioners and family physicians, 145 pediatricians, 97 child psychiatrists, 21 developmental pediatricians, and 120 others who could not be categorized into the other major groups. There were 73 responses from the Atlantic region, 149 from Quebec, 122 from Ontario, 84 from the Prairies, and 93 from the Western region.

Sample Demographics

Demographic information showed that the majority of physicians who responded (64%) were between ages of 35 and 54 with an overall average age 45.6 years. Fifty-six percent of the respondents were male and 43% were female. The majority of respondents received their medical degrees within Canada (73%). Other respondents reported graduating from the United Kingdom, Asia, Africa, Australasia, U.S.A., and other European countries, in order of frequency. Most responding physicians earned their medical degrees in the 1970s and 1980s. Over half of the respondents indicated practicing in a private group setting or private solo practice. Other practice settings included community health centres and hospital settings.

All Respondents

All 636 respondents completed the first part of the survey questionnaire dealing with general practices and attitudes regarding Attention Deficit/Hyperactivity Disorder (ADHD) and the use of methylphenidate (MPH). Overall, 80% of all respondents reported having ever seen a patient who had been diagnosed with ADHD. Further, of these physicians, 84% (or 67% of all respondents) reported having ever prescribed MPH to treat ADHD. Finally, of those who had prescribed MPH for ADHD, 85% (56% of all respondents) reported currently having patients on MPH for ADHD. Approximately 27% of respondents reported using MPH for the treatment of medical disorders other than ADHD or ADD.

In the 12 months prior to the survey, approximately 50% of all respondents reported formal professional development as a source of information on ADHD, while 46% of all respondents reported referencing scientific journals, and 42% consulted with colleagues (42%). One-third of the responding physicians used information about ADHD provided by their patients (32%). Overall, developmental pediatricians, pediatricians, and child psychiatrists were most likely to report referencing outside sources for information on ADHD. For all sources of information, physicians who reported having patients with ADHD or who were treating ADHD patients with MPH were substantially more likely to use each of the listed sources.

Physician ratings of a series of scaled statements indicated that the approach to, or opportunities for, diagnosis of ADHD needs improvement. Respondents agreed that there are too few properly qualified diagnosticians for ADHD (58%), and that physicians are not well informed about standard diagnostic criteria (60%). There was modest agreement that MPH is the treatment of choice for ADHD (51%). There was considerable agreement that MPH is more effective when used as part of a multi-modal course of treatment for ADHD (84%). There was also modest agreement with the statement that physicians are under pressure to prescribe MPH (55%).

Overall, 68% of all respondents reported that MPH use had increased in their experience. Physicians agreed with the following statements as explanations for the increased use of MPH at the national level in the treatment of ADHD: increased public awareness of ADHD and its treatments (86%); pressure from parents and teachers to use medication to treat ADHD (76%); a general increase in acceptance of medication as a treatment for ADHD (70%); and, a lack of resources for other interventions (68%).

Respondents Treating ADHD

The second part of the survey questionnaire dealt with issues specific to the 392 physicians (62% of all respondents) who were actively involved in the treatment of ADHD. In this section, respondents who had seen patients for ADHD estimated that they had seen an average of 47.5 of these patients in the past 12 months (midpoint = 12). Of those patients seen for ADHD, an average of 27.0 patients were reported to have been treated with MPH (midpoint = 5). Based on these numbers, it is estimated an average of 66% of all patients diagnosed with ADHD were being treated with MPH. Teacher concern was rated as often or always the source of a patient referral by 82% of respondents, followed closely by parent concern (71% of respondents). However, 57% of physicians reported that parents were often or always comfortable in discussing the possibility that their child had ADHD.

A large proportion of respondents who treated ADHD often or always preferred to diagnose (52%) and treat (53%) ADHD patients themselves. Further, the majority of physicians used either standard diagnostic criteria (15% sometimes and 50% always) or the DSM IV (17% sometimes and 48% always). Preferred criteria for diagnosis were: impaired functioning at home, school, or work (98%); inattention symptoms (96%); impulsivity symptoms (91%); clinically significant impairment (90%); duration of symptoms (88%); and, hyperactivity symptoms (84%). The most consistently used data collection method was interviews with the patient and family (95%).

Respondents who treated ADHD reported that they typically take an average of 69 minutes with a patient when they are diagnosing for ADHD, and spend an average of 47.5 minutes in administration. MPH is by far the most frequently reported medication intervention prescribed by physicians (52%). Frequently, though, MPH is prescribed in conjunction with other interventions (69% said often or always). Selecting from a list of categories, over three-quarters of all physicians indicated that patients with ADHD tend to remain on MPH for an average of one to five years.

The most frequently recommended non-medication interventions for ADHD were the provision of verbal information (82%) and general support (82%). Less frequently, respondents reported: providing liaison with schools or employers (64%); providing written materials (60%); recommending behavioural therapy (55%); educational intervention (53%); individual therapy (15%); diet (9%); and marital therapy (5%).

In general, 39% of respondents who treated ADHD often or always felt pressured to prescribe MPH by teachers and 16% often or always felt pressured by parents. Further, they relied on routine scheduled follow-up visits (88%), asking parents or patients to call if side effects are experienced (83%), and physical examinations (71%) to detect side effects with MPH use. The most frequent method of assessing efficacy was to schedule appointments to review the treatment's progress (87%).

Respondents' ratings indicated that only rarely did such factors as MPH cost (0%), eventual loss of effectiveness (2%), current ineffectiveness (3%), side effects (5%), worry about long term effects (6%), or trouble maintaining the medication routine (6%) influence patients' decision to stop using MPH.

Finally, when respondents were provided with an opportunity at the end of the survey to specify in their own words the kinds of help that would be most useful to them in working with patients with ADHD, the three most frequent replies were as follows:

- continuing medical education (37% of respondents)
- the availability of information materials for physicians (27% of respondents)
- the availability of information materials for patients and parents (20% of respondents).

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1 Introduction

This study was undertaken by Health Canada's Therapeutic Products Programme (TPP) to obtain feedback from Canadian physicians regarding the use of methylphenidate (MPH), available under the brand name Ritalin or other generic products, particularly in connection with its role in the treatment of Attention Deficit/Hyperactivity Disorder (ADHD). According to Health Canada data, annual consumption of MPH has increased by 500% between 1990 and 1997. Similar trends have been shown elsewhere in the world according to a United Nations report on psychotropic substances. In this report, Canada rated second only to the United States in medical use of MPH, primarily for the treatment of Attention Deficit Disorder (ADD) and ADHD in children.

A similar increase in the diagnosis of ADHD has also been documented (Swanson, Lerner, & Williams, 1995). Research has found that the prevalence of diagnosis of ADHD and its consequent treatment with MPH differs from physician to physician (Rappley, Gardiner, Jetton, & Houang, 1995) and can be sensitive to external factors such as the incidence of medical lawsuits (Safer, 1994). Much of the focus of research has been on the wide variety of diagnostic criteria used by physicians, and the wide range of treatment approaches that are available (Ruel & Hickey, 1992; Wolraich, Lindgren, Stromquist, Milich, Davis, and Doretta, 1990; Kwasman, Tinsley, & Lepper, 1995). For example, the most widely used criteria in the world is the International Classification of Diseases (ICD), although in North America the Diagnostic Statistical Manual (DSM) is the most prevalent system. The incidence of hyperkinetic disorder is 0.78% for the CSD-10, but 6.1% for ADHD under the DSM III and 8.9% under the DSM III-R. These differences can be explained by the restrictiveness of the diagnostic criteria, possibly accounting for some of the discrepancy in increased use of MPH in North America.

The survey described in this report was undertaken to obtain physician input about factors that may correlate with MPH use in the Canadian context, including measures of the use of different diagnostic criteria, prescriber knowledge and training, and treatment practices. It is important to note that this survey was undertaken to provide descriptive data on physician perceptions and opinions regarding the diagnosis of ADHD and its treatment with MPH and was not intended to establish objectively verifiable measures of behaviour or conditions.

Specifically, the objectives of this project were to obtain feedback from randomly selected Canadian physicians from various medical specialties in order to:

- determine how physicians diagnose Attention Deficit/Hyperactivity Disorder (ADHD)
- determine how physicians treat ADHD
- assess the conditions under which physicians prescribe methylphenidate (MPH)
- assess the kinds of influences and pressures physicians experience in prescribing MPH
- determine how physicians monitor medication use and regimen compliance
- determine how physicians assess treatment efficacy.

2 Methodology

A questionnaire focussing on the study objectives was developed by Health Canada and translated into French. Based on results of a pretest of the questionnaire, modest revisions to question wording, sequence, and formatting were made. The survey packages, consisting of a cover letter, a questionnaire, a self-addressed postage-paid return envelope, and a postcard that registered the physician as having completed the questionnaire were mailed the week of April 5 to 9, 1999.

All materials sent to respondents in Quebec were in both French and English. Unfortunately, in one question the label specifying that respondents were to indicate the number patients treated "with MPH" was omitted from the French version (question 8 in the questionnaire, Table 2 in the report) and may have possibly altered responses of French-speaking respondents. There were no other differences between the content of the English and French materials.

Telephone reminder calls with the physicians in the sample were conducted during the week of April 19 to 23. Contact with all physicians was attempted and records kept of refusals, retirements, moves, etc. As well, replacement questionnaires were faxed to any physician that requested a new copy. A second follow-up, in the form of a reminder notice was mailed to all physicians who did not return a survey registration card during the week of April 26 to 30.

The five major professional medical organizations in Canada were notified of the survey so they could respond to any member inquiries about the study. Further, the Canadian Medical Association agreed to have its name included in the survey cover letter as willing to participate in reviewing the survey findings and conclusions with Health Canada.

An initial sample of 3,320 physicians were randomly selected to participate in this study. The sample was stratified by region and by area of specialization (general and family practitioners, pediatricians, developmental pediatricians, and child psychiatrists). The five regions included the Atlantic region (Newfoundland/ Labrador, Prince Edward Island, Nova Scotia, and New Brunswick), Quebec, Ontario, the Prairies (Manitoba, Saskatchewan, and Alberta), and the Western region (British Columbia). The sample was drawn from the Canadian Medical Directory based on physicians' indication of their primary area of practice. Samples were drawn for general and family practitioners and pediatricians within each region, while developmental pediatricians and child psychiatrists were both a full census.

Table 1. Sample sizes by Region and Specialty.

		Atlantic	*Quebec*	*Ontario*	*Prairies*	*Western*	*National**
General/ Family practitioner	*Population*	2,284	7,477	9,947	4,433	4,238	28,379
	Sample	400	500	500	500	500	2400
	Returns	27	63	52	29	37	253
	Response	6.8%	12.6%	10.4%	5.8%	7.4%	10.5%
	Weight	1.54	1.62	2.61	2.09	1.56	n/a
Pediatricians	*Population*	147	670	854	361	237	2,269
	Sample	100	100	100	100	100	500
	Returns	16	26	26	18	28	145
	Response	16.0%	26.0%	26.0%	18.0%	28.0%	29.0%
	Weight	.13	.35	.45	.27	.12	n/a
Child psychiatrists	*Population*	24	68	178	43	43	356
	Sample	24	68	178	43	43	356
	Returns	9	29	17	16	15	97
	Response	37.5%	42.6%	9.6%	37.2%	34.9%	27.2%
	Weight	.04	.03	.14	.04	.04	.04
Developmental pediatricians	*Population*	5	8	27	13	10	64
	Sample	5	8	27	14	10	64
	Returns	4	2	7	3	0	21
	Response	80.0%	25.0%	25.9%	21.4%	0%	32.8%
	Weight	.02	.05	.05	.06	0	n/a
Other	*Returns*	17	29	20	18	13	120
TOTAL	*Population*	2,460	8,223	11,006	4,850	4,528	31,068
	Sample	529	676	805	657	653	3,320
	Returns	73	149	122	84	93	636
	Response	13.8%	22.0%	15.2%	12.8%	14.2%	19.2%

***NOTE**: The national totals include cases for which region could not be identified, it is not a simple summation of the regional values.*

Table 1 shows five critical values for each area of specialty within each of the five regions. The row represented by "Other" include specialty areas indicated by respondents that could not be categorized into one of the target specialties. The first value is the total population as defined by the primary interest area of all physicians in the Canadian Medical Directory. The second value is the number of questionnaires that were sent out for the study. The third set of values is the number of completed questionnaires received back from physicians. Finally, the last row of values are a set of weights which, if applied to the obtained data, will force it to have the same proportions as the original population.

It can be seen in Table 1 that response rates for individual strata ranged from 0% to 80%, for an overall return rate of 19%. Of the 3,320 potential participants who were sent questionnaires, 198 contacts were invalid because of change of address, incorrect address, being on extended leave, or retired, leaving a maximum eligible sample of 2,970. Thus, the response rate based on the eligible sample was 20.4%.

3 Results

The different response rates obtained for the various strata prompted the creation of a weighted sample in which each of the strata was statistically adjusted to represent its actual proportion in the population. For example, general practitioners/family physicians represented 7.4% of all physicians in the combined target populations (four specialties in all regions), but only 6.4% among returned questionnaires, a full percentage point less. Therefore, by applying weights each member of this group, the results will become representative of 1.15 respondents. That is, their contribution to overall estimates is proportional to their representation in the population.

The appropriate weights were calculated and applied to responses in all strata of the sample. A total of 241 cases were lost in the weighting process because their membership in the pre-established strata could not be determined.

Comparisons of weighted and unweighted data revealed very little difference in the estimates produced. Therefore, because the weighted sample is conceptually more difficult to present and loses a significant proportion of the cases, the results in this report are presented for the unweighted data.

Note that for all discussions of scaled responses, the values for the top two responses on the scales ("4" and "5" on 5-point scales) were combined for reporting purposes unless explicitly described otherwise. Thus, on statements rated using a 5-point agreement scale ranging from 1=Strongly disagree to 5=strongly agree, the response options for agreed (4) and strongly agreed (5) were combined and reported in the text simply as "agreed."

Responses to all questions were analyzed for differences within key demographic groups, such as medical specialty, region, age, gender, years in practice, etc. Statistically meaningful differences that were found are reported throughout the body of the report as applicable.

3.1 Respondent characteristics

The mean[1] age of respondents was 45.6 years, with the youngest reported age being 25 years of age and the oldest being 80 years of age. The distribution of respondent ages is presented in Figure 1.

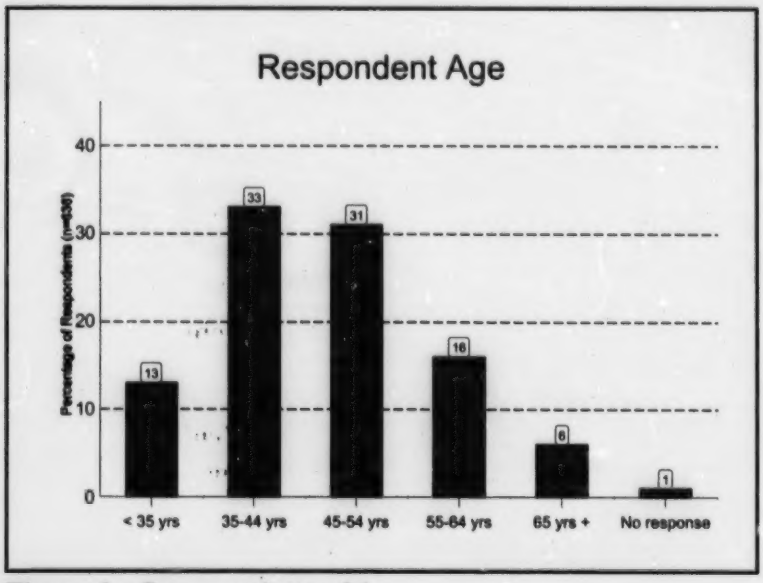

Figure 1: *Survey question 26.*

Statistical analyses revealed that respondents from the United Kingdom (mean = 55 years of age) and Asia (mean = 52 years of age) were significantly older than respondents from Canada (mean = 45 years of age).

As shown in Figure 2, 56% of respondents were male and 43% were female (1% did not respond to this item).

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[1] The *mean* is calculated by summing all of the values in a set and then dividing the sum by the number of values. This is the value commonly referred to as the *average*. In technical literatures, though, the term *average* is used to describe many different measures of central tendency, therefore the term *mean* is preferable as a term free of ambiguity.

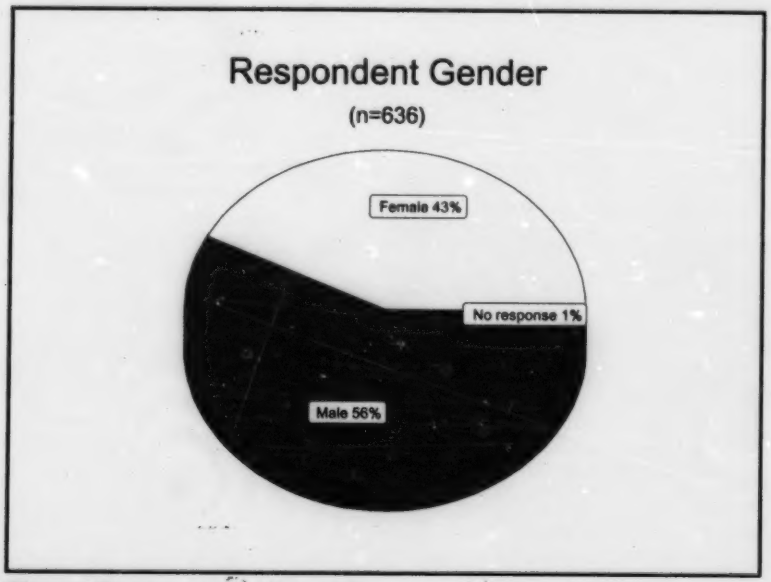

Figure 2: *Survey question 27.*

Comparing the differences between male and female respondents on other key variables, it was found that more female respondents (47%) than male respondents (41%) indicated they were general/family physicians. However, a larger proportion of the male respondents (29%) reported being pediatricians compared to female respondents (19%). Further, male respondents were more likely to have graduated in the United Kingdom than were female respondents (12% of males and 6% of females), while female respondents were more likely than male respondents to have graduated in Canada (81% of females and 71% of males).

The majority (73%) of respondents received their medical degrees within Canada. Most medical degrees earned outside of the country came from the United Kingdom (9%). Only 2% of the physicians earned their medical degree in the U.S.A. Within Canada, most medical degrees were earned in Quebec (23%). The distribution of medical degree sources is presented in Figure 3. Note that 4% of the respondents provided names that were either vague and could not be attached to a single institution (e.g., "U of M") or could not be identified --these are indicated as "Unknown" in the figure.

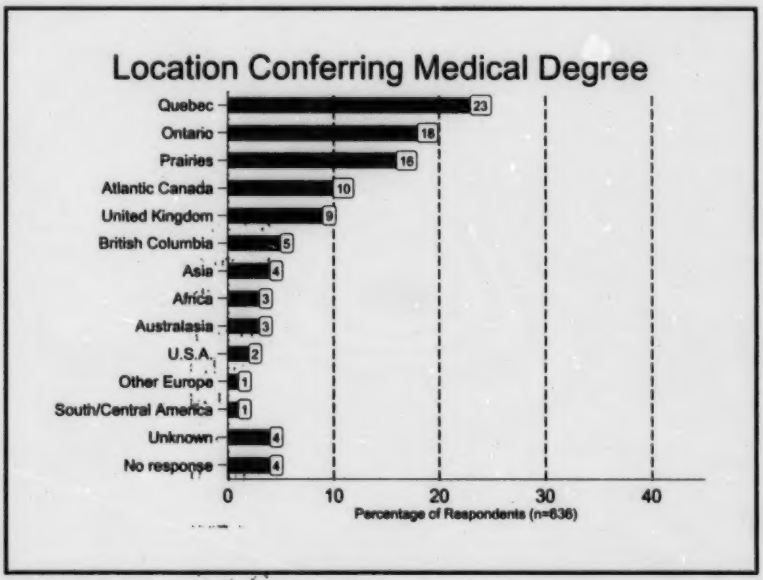

Figure 3: *Survey question 28.*

Most responding physicians earned their medical degree in the 1970s and 1980s, with the median, or midpoint, being 1979. The highest number of graduates from a single year came in 1980. Figure 4 shows the distribution of graduation years for respondents.

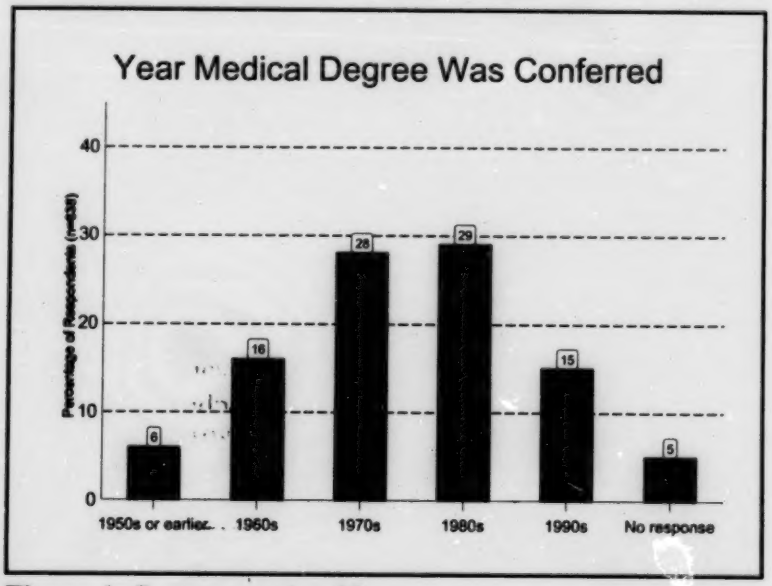

Figure 4: *Survey question 29.*

Statistical analyses revealed that age and year of medical graduation were moderately correlated ($r = -.33$)[1]. Further, female respondents graduated more recently than male respondents on average (male mean = 1974; female mean = 1982).

[1] The Pearson correlation coefficient, or *r*, is a measure of association between two different variables. Correlations range from +1.0 to -1.0. A correlation of +1.0 indicates that an increase of *X* units in one variable is directly related to an increase of *Y* units in the second variable. A correlation of -1.0 indicates that an increase of *X* units in one variable is directly related to an decrease of *Y* units in the second variable. A correlation of 0.0 indicates that there is no relation between the two variables. It is important to note that correlation between two variables cannot be taken to imply a causal relationship.

Respondents indicated having practised medicine for a mean of 17.5 years. The maximum number of years mentioned was 50 years. The distribution of years is provided in Figure 5. Although years in practice were highly correlated with year of graduation, there were some discrepancies reported. Some respondents reported more years in practice than their graduation year would allow, while some respondents reported fewer years. Two possible explanations for seeming over-reporting of years in practice could be, first, if the physician was in another area of practice before receiving a second degree or, second, some physicians estimates included pre-degree activities, such as internships. The report of fewer years of practice than the graduation year would suggest may indicate that physicians delayed entering their current area of practice or practised in another area of specialty before settling on their current area.

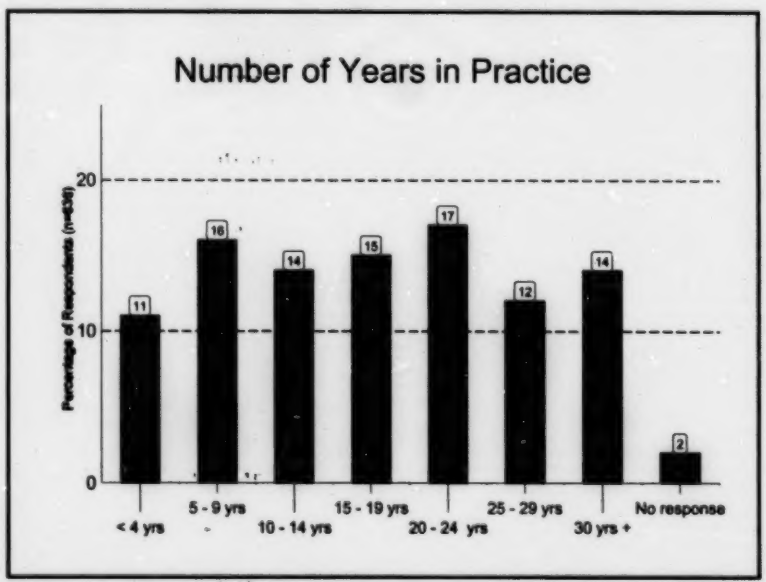

Figure 5: *Survey question 31.*

Analysis of years in practice showed that male respondents had been in practice longer than female respondents (male mean = 20.8 years; female mean = 13.0 years). Further, respondents who had graduated in South or Central America (mean = 26 years), Asia (mean = 21 years), and the United Kingdom (mean = 27 years) tended to be in practice longer than respondents graduating from Canada (mean = 16 years), Africa (mean = 15 years), or other European countries (mean = 14 years). As would be expected, years in practice were correlated with age (r = .90) and year of graduation (r = -.92).

Respondents also provided information on the year that they began their practice. The median year for beginning current practices was 1981. The year in which the largest number of practices began was 1979. The distribution of years is displayed in Figure 6. This distribution resembles closely that shown in Figure 4 for the year that respondents' medical degrees were conferred. There is a strong correlation between responses to these two items, even though there was considerable lag for some respondents between these two dates.

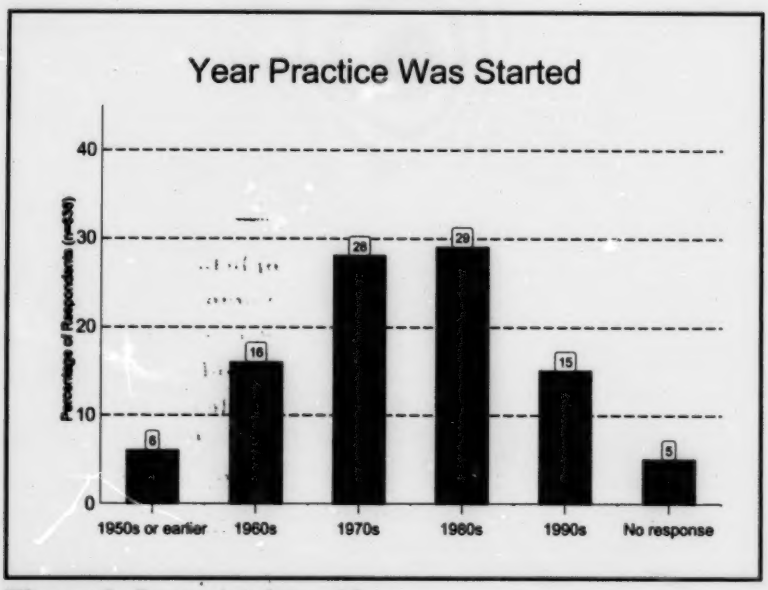

Figure 6: *Survey question 33.*

As would be expected, the year that respondents started practising was correlated with age (r = -.91), year of graduation (r = .93), and with number of years of practice (r = -.96). As with findings for the number of years in practice, male respondents began their practice earlier on average than female respondents (male average = 1977; female average = 1985). There was also a tendency for respondents from South or Central America, Asia, and the United Kingdom tended to be in practice longer than respondents graduating from Canada, Africa, and other European countries.

Over half of the respondents indicated working in private practice, either in a group setting (30%) or as a solo practice (26%; response categories were provided). While 72% of all respondent indicated practising in a single setting, 20% indicated that they worked in two different settings, and 6% worked in three or more different settings (2% did not respond). Some of the "Other" settings frequently named by respondents in their own words included: "locums" (2%), a public health department (1%), a rehabilitation centre (1%), a child and adolescent treatment centre (1%), and a rural practice (1%).

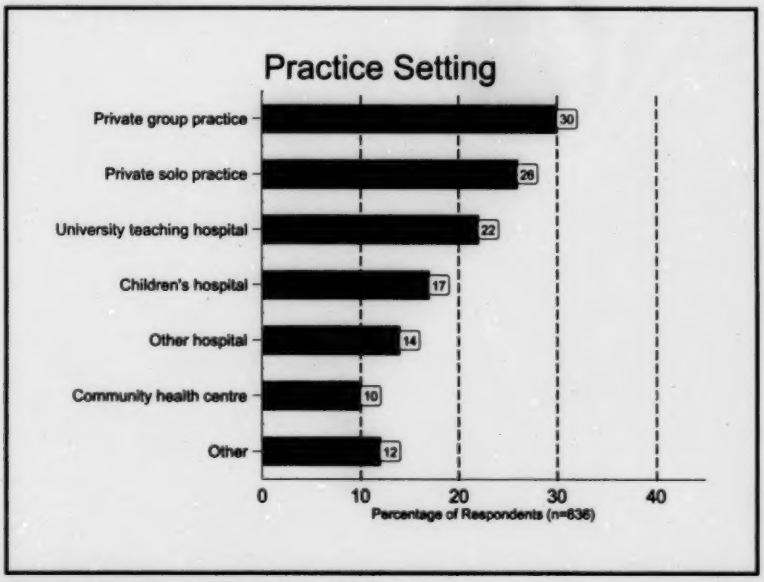

Figure 7: *Survey question 32.*

Analysis of practice setting by age revealed that physicians from children's hospitals (mean = 48.8 years of age), other hospitals (mean = 44.3 years of age), and group private practice (mean = 44.1 years of age) tend to be younger than other physicians, while those in solo private practice tended to be older than other physicians (mean = 51.6 years of age). Further analyses revealed that respondents with different specializations were most likely to practice in each setting:

- 52% of developmental pediatricians and 40% of child psychiatrists practiced in a children's hospital

- 71% of developmental pediatricians, 35% of pediatricians, and 44% of child psychiatrists practiced in a university teaching hospital
- 22% of child psychiatrists and 24% of "other" specialties practiced in other hospitals
- 19% of child psychiatrists and 13% of general practitioner/family physicians (13%) practiced in community health centres
- 37% of pediatricians and 33% of child psychiatrists practiced in a private solo practice
- 51% of general practitioners/family physicians practiced in private group practices.

As well, male respondents were more likely than female respondents to practice in solo private practices (33% of male respondents and 17% of female respondents). Finally, it was found that respondents in solo private practice had been in practice longer than other physicians (mean = 21.8 years), while respondents in group private practice had been in practice for less time than other physicians (mean = 15.9 years).

3.2 General Practices and Attitudes

All respondents completed the first part of the survey questionnaire dealing with general practices and attitudes regarding Attention Deficit/Hyperactivity Disorder (ADHD) and the use of methylphenidate (MPH). The second part of the survey questionnaire dealt with issues specific to physicians who were actively involved in the treatment of ADHD. The current section of the report deals with results from the first part of the survey.

3.2.1 Proportion of Physicians Diagnosing and Treating ADHD

Overall, 80% of all respondents reported having ever seen a patient that had been diagnosed with ADHD. Further, of these respondents, 84% (or 67% of all respondents) reported having prescribed MPH to treat ADHD. Finally, of those who had prescribed MPH for ADHD, 85% (56% of all respondents) reported currently having patients on MPH for ADHD.

Analysis showed that fewer than half (46%) of the respondents from specialties other than the four targeted specialties (general/family practitioners, pediatricians, developmental pediatricians, and child psychiatrists) had seen patients for ADHD, the least of all groups. Further, just 63% of this group who had seen patients for ADHD had prescribed MPH. Finally, 47% of the respondents in this group who had every used MPH had patients at the time of the survey.

As well, respondents from Quebec were less likely than other respondents to have reported seeing patients for ADHD. Overall, 69% of respondents from Quebec reported seeing patients for ADHD compared to the overall average of 78% of respondents.

Respondents who had prescribed MPH to patients tended to be older than other respondents (mean = 47.4 years) and to have been in practice longer (mean = 18.2 years). Finally, 87% of male respondents prescribed MPH for ADHD, compared to 80% of female respondents.

3.2.2 Reasons for Discontinuing MPH Prescription

The responses to a provided list of possible reasons for discontinuing prescription of MPH in the treatment of ADHD are presented in Figure 8. The number of respondents to this item (n=424) includes those respondents who have treated ADHD patients with MPH at any time in the past, as described in the previous section, regardless of whether they currently have patients currently on MPH.

These statements were rated by respondents who no longer had patients with ADHD and those who had discontinued MPH treatment only for some of their ADHD patients. As the figure shows, concerns about side-effects, ineffectiveness, or use of other stimulants were not major factors in deciding to discontinue MPH treatment. Concern about bad publicity or the possibility of lawsuits was very rarely a factor.

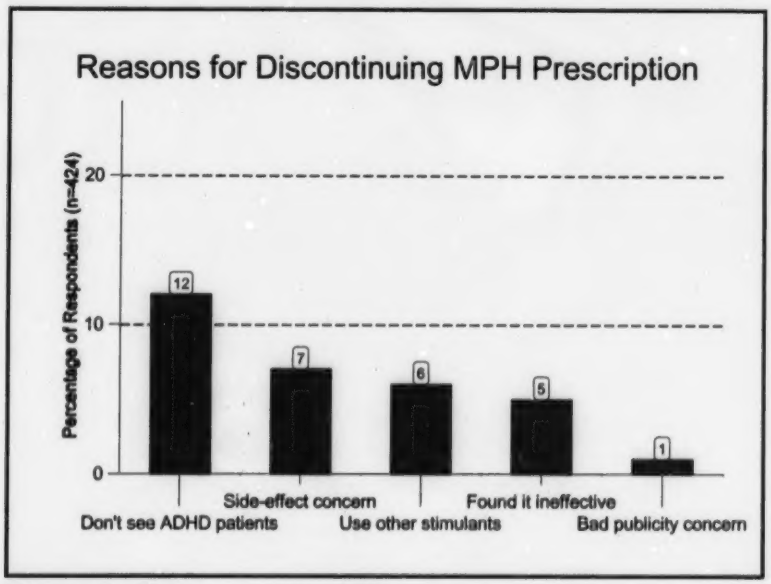

Figure 8: *Survey question 1 d).*

3.2.3 Use of MPH for Treating Other Disorders

Approximately 27% of respondents reported using MPH for the treatment of medical disorders other than ADHD or Attention Deficit Disorder (ADD). Analyses found that respondents prescribing MPH for other disorders were older than other respondents (mean = 48.7 years) and had been in practice longer (mean = 19.3 years). It was also found that 55% of respondents from the Atlantic region reported using MPH for other disorders, significantly more than other regions. Further, it was found that 67% of developmental pediatricians and 74% of child psychiatrists reported using MPH for disorders other than ADHD or ADD, which was the most of any specialty groups.

Figure 9 shows the proportion of respondents reporting the use of MPH for selected disorders. Physicians indicated that MPH was used to treat narcolepsy (12% of all respondents, 29% of respondents treating other disorders), depression (7% of all respondents, 17% of respondents treating other disorders), learning problems (6% of all respondents, 16% of respondents treating other disorders), and conduct disorders (5% of all respondents, 12% of respondents treating other disorders).

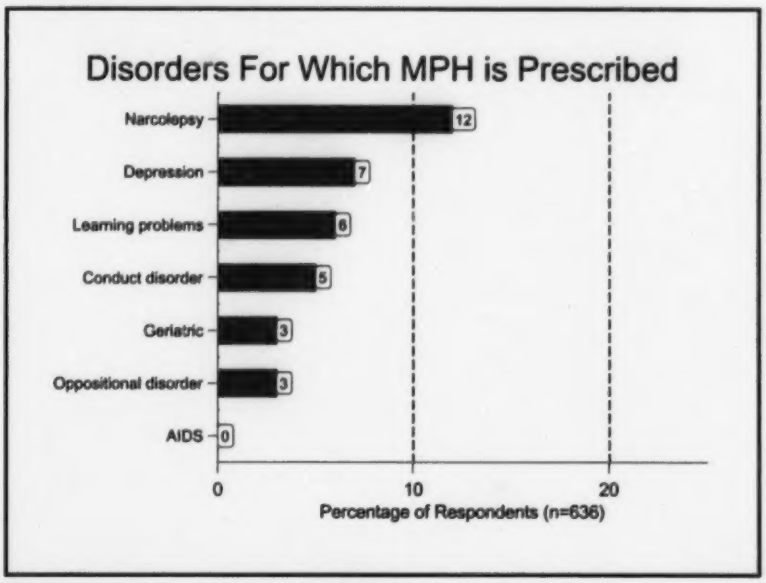

Figure 9: *Survey question 2 b).*

None of the respondents reported using MPH for the treatment of AIDS (respondents were presented with the list of disorders and asked to mark all appropriate items).

3.2.4 Sources of Information about ADHD

Respondents' reported use of various sources of information about ADHD in the past 12 months is shown in Figure 10 (responses were listed for respondents to rate). As the figure shows, approximately half of all respondents reported obtaining information from referencing scientific journals (46% of respondents), while over two-fifths (42%) of the respondents consulted with colleagues. Further, one-third of the respondents (32%) reported learning more about ADHD directly from their patients and 27% obtained information from formal professional development.[1] Least used as sources were popular media (17%) and the Internet (14%).

[1] The formal professional development category was created by adding the number of respondents who indicated obtaining information about ADHD by using professional workshops (22% of respondents) and the number of respondents who indicated using continuing medical education courses (28% of respondents). These two items were judged to be sufficiently similar that reporting them separately was misleading regarding the proportion of respondents receiving professional development. Overall, 19% of all respondents specified that they used both professional workshops and continuing medical education courses.

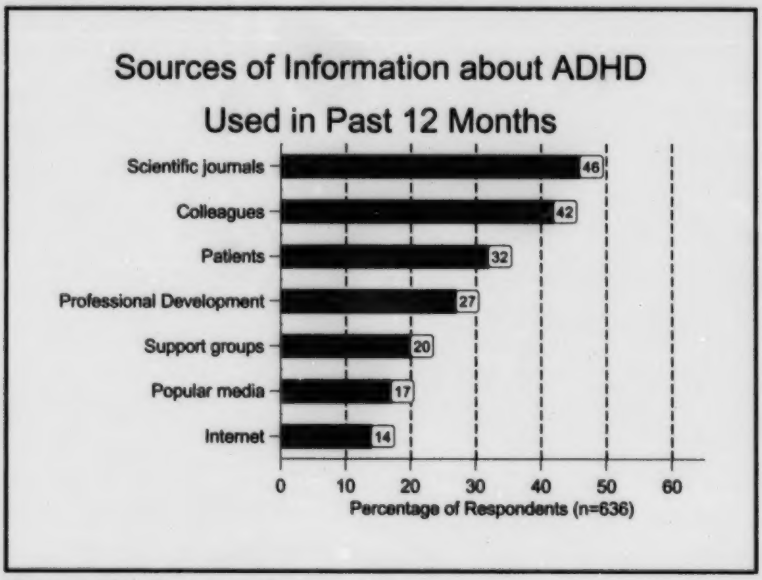

Figure 10: *Question 3.*

It should be noted that some respondents commented that there were differences in the way they would use different materials that are not reflected in these results. For example, scientific journals would be used for serious reference while popular media would be read casually and only for a general sense of public awareness.

Overall, developmental pediatricians, pediatricians, and child psychiatrists were most likely to report referring to each of the sources listed in Figure 10 for information on ADHD. General/family physicians were among the least likely to consult with any of these sources. Older respondents tended to be more likely to read scientific journals, talked with patients, and read support group literature than younger respondents.

For all sources of information, physicians who reported having patients with ADHD or who were treating ADHD patients with MPH were substantially more likely to use each of the listed sources.

3.2.5 Opinions about ADHD Diagnosis

Figure 11 shows that, regardless of whether they prescribed MPH or not, a large proportion of respondents believed that there is room for improvement in the diagnosis of ADHD. Respondents tended to agree that there are too few properly qualified diagnosticians for ADHD and that physicians in general are not well informed about standard diagnostic criteria. Further, opinion was split on whether ADHD diagnostic criteria were too vague (nearly one-third of respondents were neutral on the scale). Finally, there was generally disagreement with the statements that ADHD has been under-diagnosed or that it was usually accurately diagnosed.

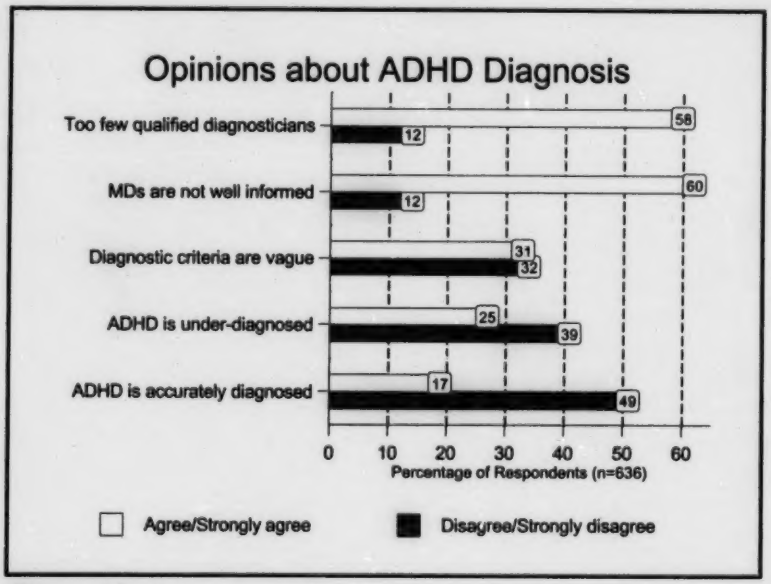

Figure 11: *Survey question 4.*

Differences in opinions about the diagnosis of ADHD were investigated between a) physicians who had ever seen a patient for ADHD and those who had not and between b) physicians who had ever treated an ADHD patient with MPH and those who had not. Only one difference was found. Thirty-seven percent of respondents who had ever seen a patient for ADHD disagreed that ADHD diagnostic criteria are too vague compared to 17% of respondents who had never seen a patient for ADHD.

Respondents rated their agreement with a number of statements about MPH prescription, as shown in Figure 12. Overall, there was considerable agreement with the statement that MPH is more effective when used as part of a multi-modal course of treatment for ADHD. There was also modest agreement with the statement that physicians are under pressure to prescribe MPH and that MPH is the treatment of choice in treating ADHD. There was some disagreement overall that MPH is appropriately prescribed.

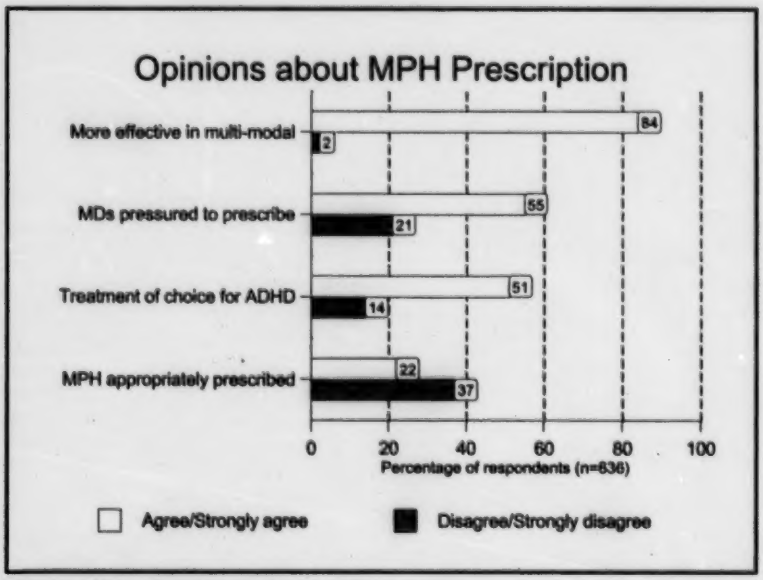

Figure 12: *Survey question 4.*

Respondents from disciplines other than the four targeted specialties were least likely to agree that MPH is more effective in multi-modal treatments: 74% of the respondents in this group agreed compared to the overall average of 84%. There was also a slight tendency for younger respondents to favour multi-modal use of MPH. Respondents from disciplines other than the four targeted specialties were also least likely to agree that MPH is the treatment of choice for ADHD; just 24% of respondents from this group agreed compared to the overall average of 51%.

Respondents from the Atlantic and Western regions were more likely than respondents from other regions to agree that MPH is being prescribed appropriately, with 27% of respondents from the Atlantic and 33% of respondents from the Western region agreeing. Seven percent of respondents from the Atlantic region disagreed that physicians are not well informed, while at the other extreme 25% of respondents from the Western region disagreed that physicians are not well informed. Respondents from the Western region were also most likely to agree that ADHD is usually accurately diagnosed, with 24% of these respondents agreeing.

There were several differences in ratings about the prescription of MPH between physicians who had ever treated an ADHD patient with MPH and those who had not. First, while 94% of respondents who had prescribed MPH agreed that MPH was best used in a multi-modal course of treatment, while only 77% of respondents who had not prescribed MPH agreed. Second, 61% of respondents who had prescribed MPH agreed that MPH is the treatment of choice for ADHD compared to 42% of respondents who had not prescribed MPH. Third, 29% of respondents who had prescribed MPH agreed that MPH is appropriately prescribed, while just 8% of respondents who had never prescribed MPH agreed.

3.2.6 Beliefs about Changes in MPH Use

As noted in the report's introduction, MPH use in Canada has risen substantially in the past five years. When physicians were asked to indicate whether, in their experience, use of MPH had changed since 1990, 68% indicated an increase in use. However, nearly one-fifth (19%) of the respondents indicated no change, while only 2% said use had decreased. These proportions are illustrated in Figure 13.

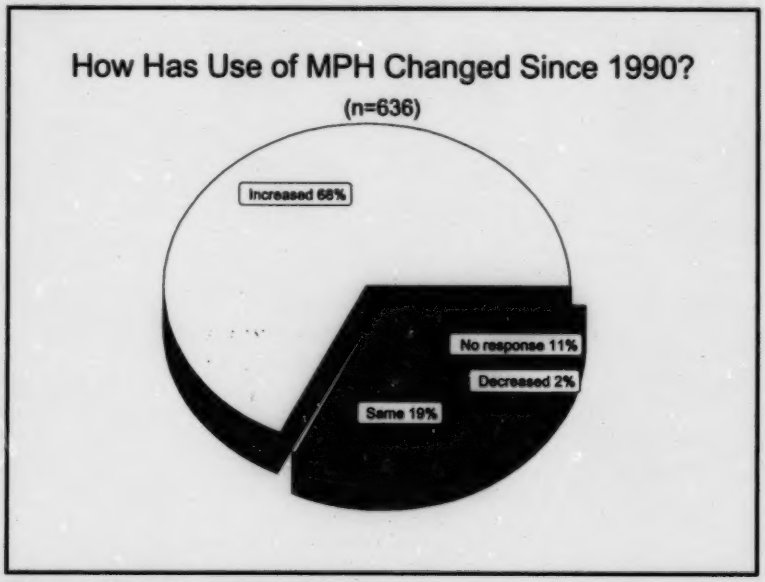

Figure 13: *Survey question 5.*

Respondents from Ontario were least likely to report than MPH use had increased (64% of Ontario respondents) and Western respondents were most likely to report that it had increased (81% of Western respondents). Finally, general/family physicians were least likely of all specialties to report that MPH use had increased (69% of general/family physicians).

After being informed of an increase in national usage of MPH over the past several years, respondents rated their agreement with a number of statements providing possible explanations for this increase. The results of these ratings are provided in Figure 14.

As the figure illustrates, increased use of MPH at the national level was agreed to be the result of several factors: increased public awareness of ADHD and its treatments; pressure from parents and teachers to use medication to treat ADHD; few resources for other interventions; and, increasing acceptance of medication as a treatment for ADHD. On the other hand, there was disagreement that diagnostic procedures for ADHD are being used appropriately. There was also disagreement that there is influence by the pharmaceutical companies to use medications.

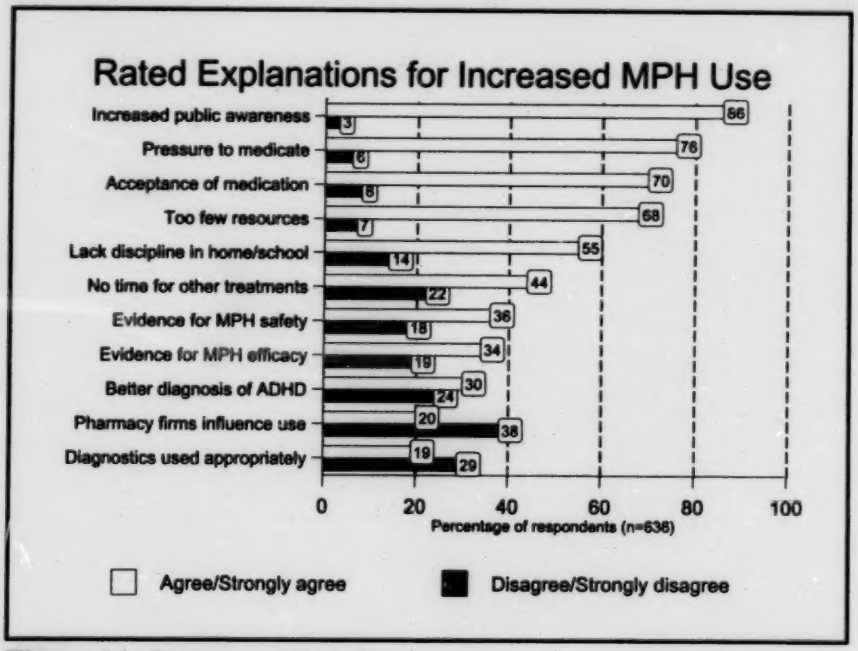

Figure 14: *Survey question 6.*

A number of divergent ratings were found among different groups. Overall, among the different specialties, developmental pediatricians were most likely to disagree with several statements. Specifically, 52% of developmental pediatricians disagreed that patients do not have time for other treatments, 38% disagreed that there is a lack of structure and discipline at home and school, and 80% disagreed that there is influence by the pharmaceutical companies to use

medications. On the other hand, 80% of general/family practitioners agreed that there is increasing acceptance of medication as a treatment of ADHD. Finally, 49% of respondents from the Prairie region agreed that there is a lack of structure and discipline in homes and schools.

Comments by respondents to an open-ended invitation to make comments on the first part of the questionnaire produced a broad range of topics. The most frequent comments were as follows:

- cuts in resources dedicated to children have resulted in a reliance on medication to address problems (6% of all respondents)
- some parents look to medication as an easy answer to behavioural problems (5% of all respondents)
- medication is an inexpensive and easier treatment for ADHD than other available alternatives (5% of all respondents)
- some parents refuse to try medication for children's problems even when it is warranted (4% of all respondents)
- there are better medications than MPH for treating ADHD (3% of all respondents)
- pressure exists to use MPH if a child is at all inattentive (3% of all respondents)
- MPH is over-prescribed (3% of all respondents).

3.3 Individual Practices and Attitudes

The second part of the questionnaire focussed upon the behaviours and attitudes of physicians who had seen patients in their practice for ADHD or related problems in the past 12 months (n=392 or 62% of all respondents).

3.3.1 ADHD Patient Profile

Two general questions about the number of patients seen and treated for ADHD were asked to all respondents who had seen patients for ADHD in the past 12 months. Physicians who had seen patients for ADHD estimated that they had seen a mean of 47.5 of these patients in the past 12 months. This distribution is highly skewed, however, with a median, or midpoint, of 12.0 ADHD patients having been seen. Of those patients seen for ADHD, a mean of 27.0 patients were reported as being treated with MPH. Again this estimate is skewed, with a median of 5.0 patients being on MPH. Based on these numbers, it is estimated an average of 66% of all patients diagnosed with ADHD were being treated with MPH. Approximately 12% of physicians had all of their ADHD patients on MPH, while only 1% of physicians had none of their ADHD patients on MPH.

In a separate exercise, respondents were asked to estimate the numbers of patients they had newly diagnosed with ADHD in the past 12 months and the number treated with MPH relative to patient age and gender. The mean numbers of male and female patients are present in Table 2. It should be noted that the estimates in this section were often poorly completed by respondents, and many complained that the amount of effort to provide these estimates was prohibitive. Therefore, the estimates should be treated as relative, in relation to other values in the table, rather than as objectively accurate estimates. As can be seen in Table 2, regardless of the accuracy of actual numbers, it is clear that males are more often diagnosed and treated for ADHD than females.

Table 2. Estimated number of patients newly diagnosed with ADHD and treated with MPH in the past 12 months.

Gender		Patients newly diagnosed	Patients treated with MPH
Male	-Mean	22.4	14.7
	-Median	8.0	5.0
Female	-Mean	6.7	4.1
	-Median	1.0	1.0
TOTAL	-Mean	29.2	18.2
	-Median	6.0	6.0

Table 3 shows the results of physicians' estimates of the number of patients diagnosed and treated for ADHD in different age categories. Again, the same cautions outlined for the previous table apply to this table. However, it is still clear from these results that ADHD patients tend to be between the ages of 5 to 12 years of age.

Table 3. Estimated number of patients newly diagnosed with ADHD and treated with MPH in the past 12 months.

Age Group		Patients newly diagnosed	Patients treated with MPH
<5 years	-Mean	2.3	0.8
	-Median	0.0	0.0
5 to 12 years	-Mean	19.5	13.3
	-Median	5.0	4.0
13 to 18 years	-Mean	5.5	3.9
	-Median	0.0	1.0
>18 years	-Mean	1.0	0.7
	-Mean	0.0	0.0
TOTAL	-Mean	28.4	18.7
	-Median	7.0	6.0

The number of patients in all of these estimates followed a roughly consistent pattern among the different discipline groups. However, developmental pediatricians saw a substantially larger number of patient than other specialties,

with a mean of 166 ADHD patients in the previous 12 months, a mean of 80 of these were treated with MPH. The next highest numbers were reported by pediatricians (who saw a mean 84 patients and treated 47 with MPH) and child psychiatrists (who saw a mean of 67 patients and treated 41 with MPH). General/family physicians had the lowest mean rates, with a mean of 7 patients seen for ADHD and a mean of 5 treated with MPH.

3.3.2 Patient Presentation for ADHD

Physicians who had seen ADHD patients indicated how frequently patients were presented for ADHD diagnosis because of different sources of concern (response categories were provided for respondents to rate). Teacher concern was rated as most often being the cause of a patient referral, followed closely by concern by parents. Referrals from other physicians, psychologists, and social workers, were less frequently the source of a patient presenting with ADHD. Sources that rarely or never resulted in a patient presenting for ADHD diagnosis were the patients themselves, legal problems, or employment concerns.

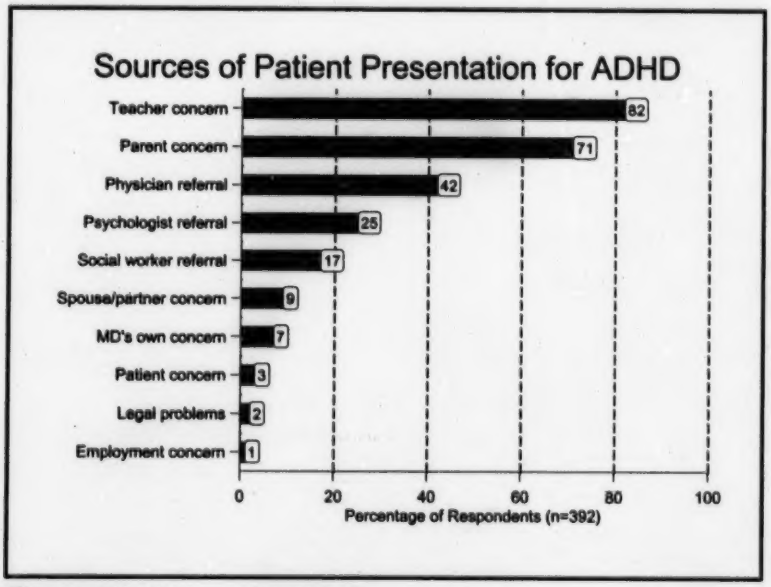

Figure 15: *Survey question 9.*

Differences among specialties were found. First, more than other specialties, 96% of developmental pediatricians reported that reasons for patients presenting for ADHD diagnosis were parent concern. Also, 53% of respondents reported referrals by psychologists as a reason. Further, 4% of child psychiatrists reported patients presenting for ADHD diagnosis because of legal problems and 35% of them reported patients presenting for ADHD diagnosis because of referrals by social workers.

3.3.3 Parent Reaction to the Possibility That Their Child has ADHD

Respondents who had seen ADHD patients indicated that, overall, parents were sometimes insistent that their child had ADHD or, conversely, were resistant to the idea that their child had ADHD (response categories were provided for respondents to rate). However, respondents most often believed that parents were comfortable in discussing the possibility that their child had ADHD.

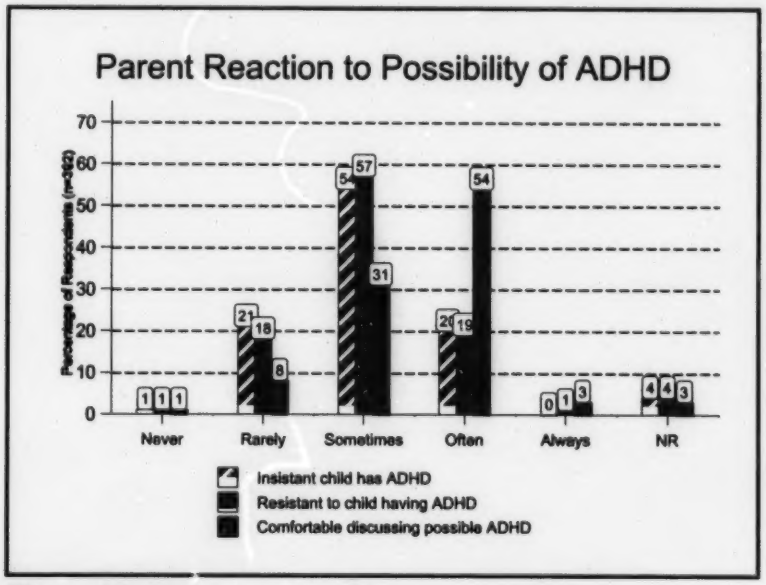

Figure 16: *Survey question 10.*

Quebec respondents reported less occurrence of parental insistence (17% of Quebec respondents responded "often" or "always") and less comfort on the part of parents in discussing ADHD (37% of Quebec respondents). Further, Quebec

respondents reported more experience with parental resistance (37% of Quebec respondents). However, respondents from the Atlantic region reported the least resistance of all respondents (11% of the Atlantic respondents responded "often" or "always" and 71% responded "sometimes").

3.3.4 Referrals for ADHD Diagnosis and Treatment

Respondents' reports of the frequency with which they referred ADHD patients to other professionals is presented in Figure 17. As the figure shows, the majority of respondents prefer to diagnose and treat ADHD patients themselves. The most frequent external source used by respondents was a pediatrician. Only rarely did respondents refer patients to psychologists or psychiatrists. Least frequent were referrals to neurologists. Further, 20% of respondents referred to "other professionals" not provided in the questionnaire:

- 2% of these respondents mentioned social workers
- 2% of these respondents mentioned teachers
- 2% of these respondents mentioned occupational therapists
- 2% of these respondents mentioned general practitioners
- 1% of these respondents mentioned developmental pediatricians

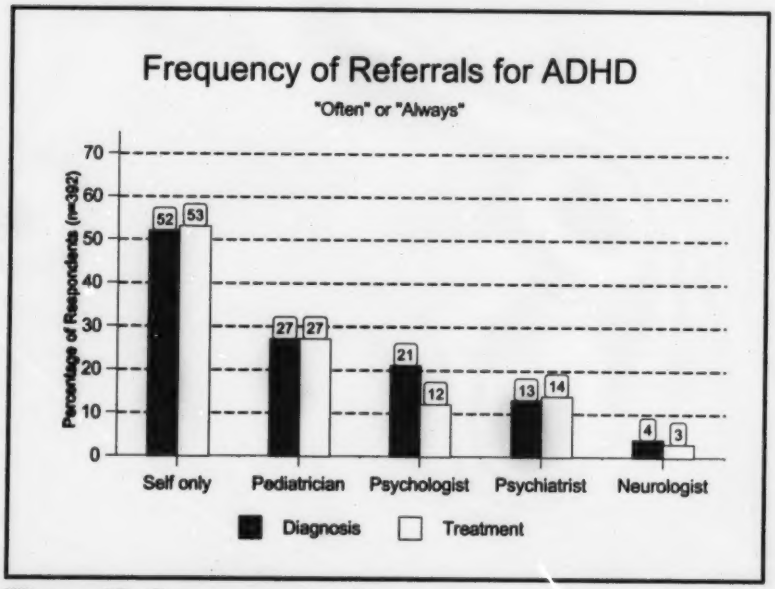

Figure 17: *Survey question 11.*

Respondents from three areas of specialty were most likely to conduct diagnosis and treatment of ADHD without referral to other professionals: 78% of developmental pediatricians did assessments themselves and 71% prescribed treatment themselves; 74% of pediatricians did assessments themselves and 81% prescribed treatment themselves; 91% of child psychiatrists did assessments themselves and 85% prescribed treatment themselves. General/family physicians were most likely to refer patients to pediatricians for diagnosis (58% of general/family physicians) and for treatment (57%). Child psychiatrists reported being most likely to refer patients to a psychologist (20% of child psychiatrists) or a neurologist (5% of child psychiatrists) for treatment or a neurologist for diagnosis (6% of child psychiatrists).

Respondents from Quebec were most likely to refer patients to a neurologist for diagnosis (15% of Quebec respondents) or treatment (13% of Quebec respondents). They were also most likely to refer to a psychologist for diagnosis (37% of Quebec respondents). Respondents from the Atlantic region were most likely to refer to a psychologist for treatment (27% of Atlantic respondents). Finally, more than other respondents, respondents from the Atlantic and Western regions were most likely to refer to pediatricians for diagnosis (46% of Atlantic respondents and 48% of Western respondents) and treatment (43% of Atlantic respondents and 49% of Western respondents), and least likely to act on their own for ADHD diagnosis (51% of Atlantic respondents and 52% of Western respondents) and treatment (56% of Atlantic respondents and 55% of Western respondents).

3.3.5 Diagnostic Criteria for ADHD

When use of diagnostic criteria was explored, the majority of respondents who had seen ADHD patients used either standard diagnostic criteria or the DSM IV to diagnose ADHD. Very few respondents reported using the DSM III, DSM III-R, ICD-9, or ICD-10. (Response options were provided to respondents to rate.) All respondents reported using at least one of these diagnostic criteria at least sometimes.

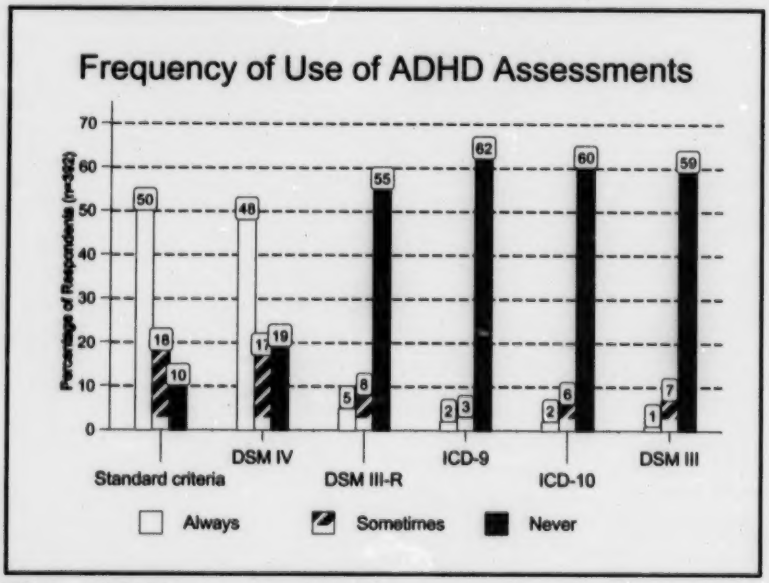

Figure 18: *Survey question 12.*

Respondents' preference for different diagnostic criteria was examined by having them rate whether they agreed that a number of criteria were important to diagnosing ADHD. Most criteria were rated highly, including: impaired functioning at home, school, or work; inattention symptoms; clinically significant impairment; duration of symptoms; and, hyperactivity symptoms. The one criteria that did not receive definitive ratings was observed impaired functioning at the physician's office.

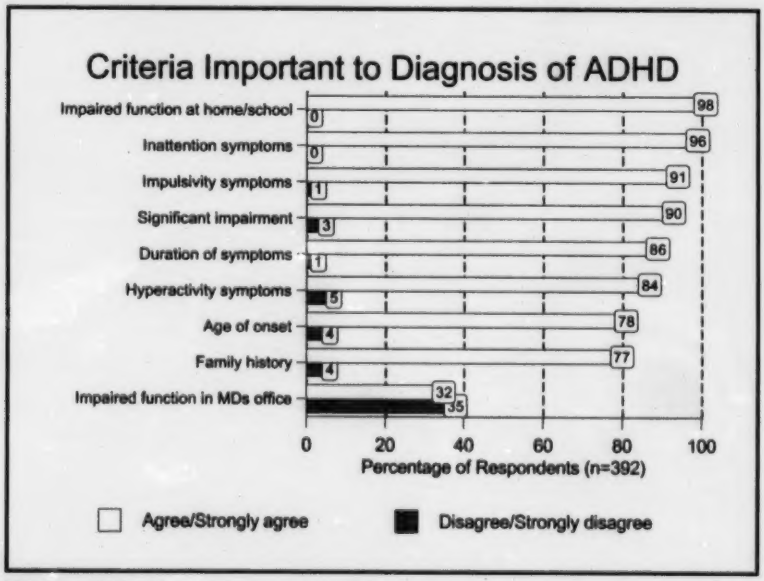

Figure 19: *Survey question 13.*

Overall, general/family physicians were least likely to use age of onset as a criteria (68% of general/family physicians agreed), but were most likely to agree with using impaired function at the physicians office (44% of general/family physicians agreed). Pediatricians were most likely to agree that inattention symptoms are important in diagnosis of ADHD (99% of pediatricians agreed). Finally, developmental pediatricians were most likely to agree with the importance of impulsiveness symptoms (100% of developmental pediatricians agreed), duration of symptoms (100% agreed), clinically significant impairment (100% agreed), and impaired function at home, school, or work (100% agreed). There was also a tendency for older physicians ($r = .21$) and those who had been in practice longer ($r = .22$) to rely more than other groups on impaired function displayed in the physician's office.

An exploration of methods respondents use to collect diagnostic information revealed the pattern displayed in Figure 20 (response categories were provided for respondents to rate). The most consistently used data collection method was interviews with the patient and family. Next most frequently used were behavioural observations in the office and physical examinations. Just over half of the respondents reported consistently using reviews of academic records, standardized self-report behaviour rating scales, and standardized behaviour rating scales completed by teachers. Least used were standardized diagnostic interviews of the patient and family (e.g., the Diagnostic Interview for Child Assessment, DICA), achievement and intelligence tests, and computerized attention tests.

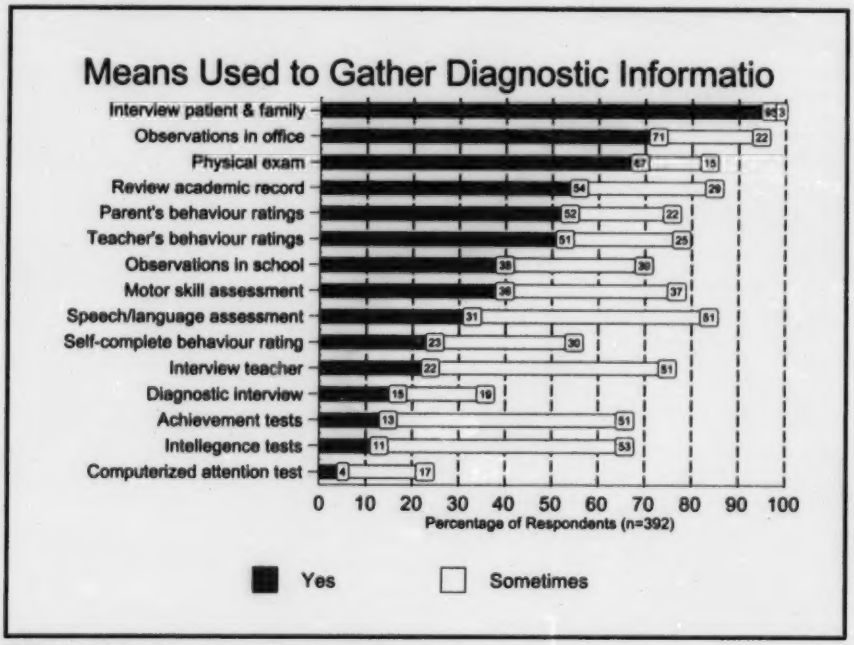

Figure 20: *Survey question 14.*

Pediatricians and developmental pediatricians were generally more likely than other respondents to definitely use ("yes") the following:

- interviews with patients and family (100% of pediatricians and developmental pediatricians)
- interviews with teachers (32% of pediatricians and 22% of developmental pediatricians)
- reviews of academic records (86% and 88%)
- standardized behaviour rating scales completed by the patient (33% and 35%), parents (68% and 100%), and teachers (67% and 100%)
- intelligence (23% and 37%) and achievement testing (25% and 53%)
- physical examinations (95% and 90%)
- motor skill assessments (65% and 56%), and
- speech and language assessments (49% and 37%).

Older respondents were more likely to report using standardized diagnostic interviews with patients and family (r = -.13), reviewing academic records (r = -.18), making behavioural observations in school (r = -.14), using achievement testing (r = -.14), but less likely to use physical examinations (r = .19).

3.3.6 Time Required to Diagnose ADHD

Respondents who had seen patients for ADHD reported that they typically take a mean of 69 minutes with a patient when they are diagnosing for ADHD. The median time (the midpoint in the entire distribution of responses) was 60 minutes. The minimum amount of time spent was 10 minutes. The distribution of the amount of time taken to diagnose patients is shown in Figure 21.

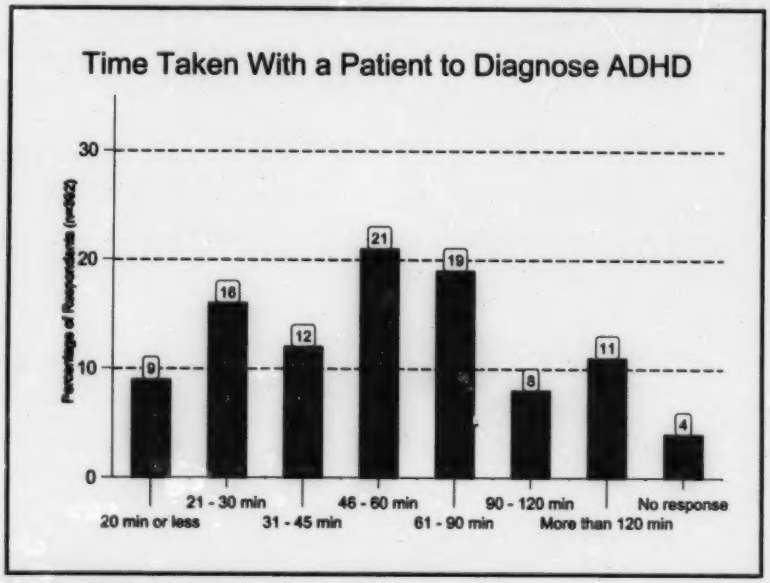

Figure 21: *Survey question 15.*

Female respondents tended to take longer than male respondents in both diagnosis time (mean = 79.1 vs. 62.8 minutes) and administrative time (mean = 55.5 vs. 42.6 minutes).

Of the various specialties, developmental pediatricians and child psychiatrists spent the most time on diagnosis (mean = 106.8 and 111.9 minutes) and administration (mean = 56.7 and 62.6 minutes). Finally, there was some tendency for respondents with degrees from the U.S.A. or South/Central America to have longer diagnosis times. Respondents with degrees from Europe, Asia, and Africa took more time in administration.

Further, respondents reported spending a mean of 47.5 minutes in administration for the typical diagnosis of ADHD. The median, or midpoint of all response, was 30 minutes. As the distribution of responses shown in Figure 22 shows, times spent tend to cluster around the 30 minute and the 60 minute points.

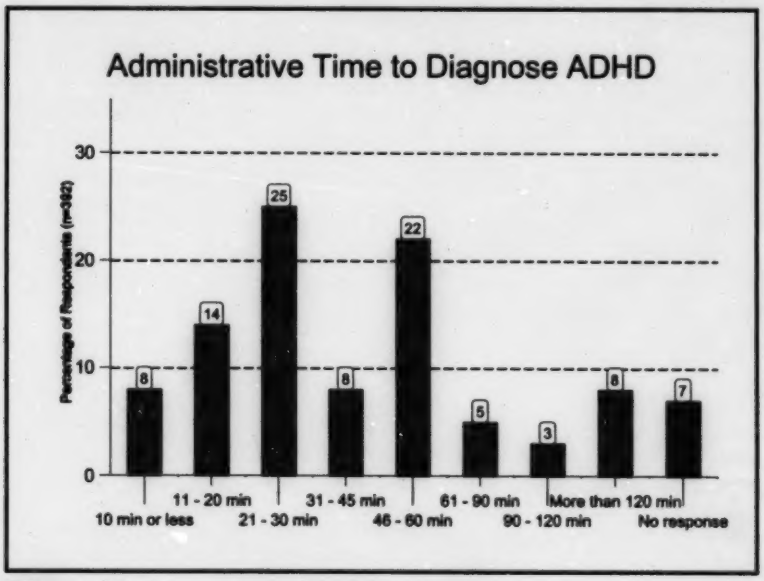

Figure 22: *Survey question 16.*

3.3.7 Recommended Interventions for ADHD

The most frequently recommended non-medication interventions for ADHD were the provision of verbal information and general support (lists were provided for respondents to rate). Less frequently, respondents reported: diet; providing liaison with schools or employers; providing written materials; recommending behavioural therapy and educational intervention. Least frequently used were individual therapy and marital therapy. "Other" interventions suggested by respondents themselves included exercise, nutrition, and sleep. Approximately 49% of the respondents always or often use more than one non-medication intervention to treat ADHD.

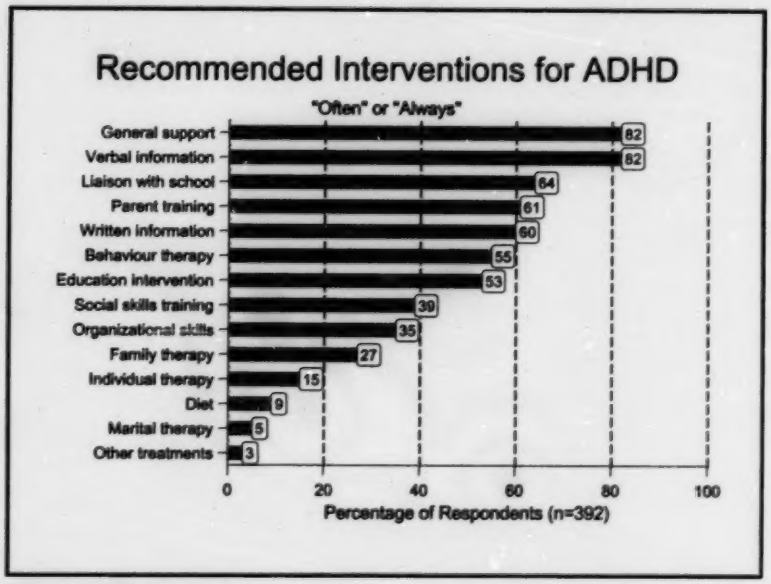

Figure 23: *Survey question 17.*

General/family physicians were least likely to indicate they often or always provided verbal information to patients (58% of general/family physicians). Developmental pediatricians were most likely to provide written material (84% of developmental pediatricians), liaise with school or employers (100%), recommend behaviour therapy (74%), and educational intervention (100%). Child psychiatrists were most likely to recommend parent training (87% of child psychiatrists), social skills training (57%), family therapy (45%), individual psychotherapy (23%), and marital therapy (9%).

Overall, female respondents were also more likely than male respondents to often or always provide written material (72% of females and 60% of males), suggest behavioural therapy (67% of females and 54% of males), parent training (75% of females and 59% of males), organizational skills training (51% of females and 32% of males), social skills training (52% of females and 37% of males), family therapy (36% of females and 25% of males), and individual therapy (20% of females and 14% of males).

In general, the Quebec region respondents were less likely than others to often or always recommend written material (44% of Quebec respondents), organization skills training (29% of Quebec respondents), or social skills training (32% of Quebec respondents).

Recommendations regarding medications for ADHD are presented in Figure 24 (response options were listed for respondents to rate). As the figure shows, MPH is by far the most frequently reported intervention prescribed by respondents. Among "other medications" suggested by respondents themselves, the most frequently cited was Risperidone (3% of the respondents). One respondent noted that MPH was just one stimulant in a larger class of similar stimulants, therefore asking specifically about MPH is clouding the issue of stimulant use to treat ADHD. However, these results suggest that MPH stands out as a unique product in the minds of physicians.

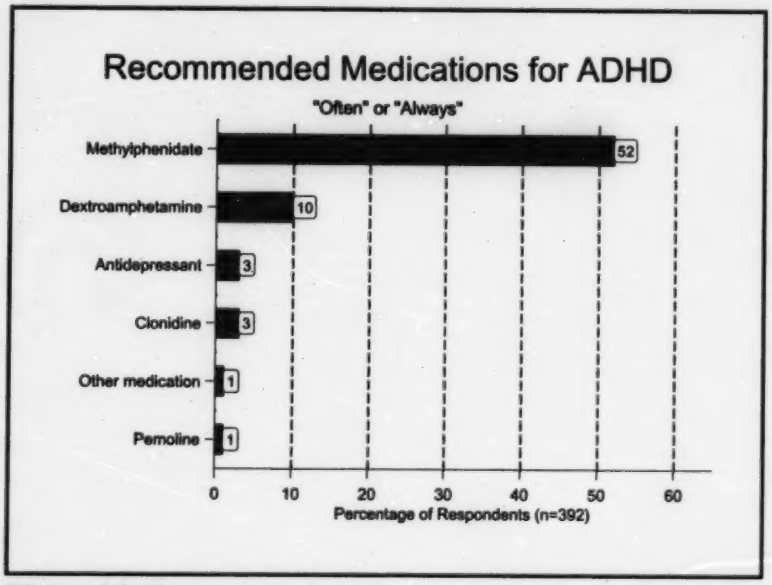

Figure 24: *Survey question 17.*

While general/family physicians were least likely of all specialty groups to often or always recommend dextroamphetamine (4% of general/family physicians), pediatricians were most likely to recommend methylphenidate (63% of pediatricians) and pemoline (13% of pediatricians). Child psychiatrists were most likely to recommend antidepressants (9% of child psychiatrists).

Quebec respondents were least likely of all regions to often or always recommend dextroamphetamine (25% of Quebec respondents) or antidepressants (3% of Quebec respondents).

3.3.8 Prescription of MPH for ADHD

Respondents who had seen patients for ADHD rated how frequently they prescribed MPH for patients with ADHD under various conditions (response options were provided), and these ratings are summarized in Figure 25. Consistent with the earlier finding reported on multi-modal treatments, the most frequent condition under which MPH is prescribed is in conjunction with other interventions. The least frequent condition under which MPH is prescribed for ADHD is when it is requested by a patient or a patient's parent.

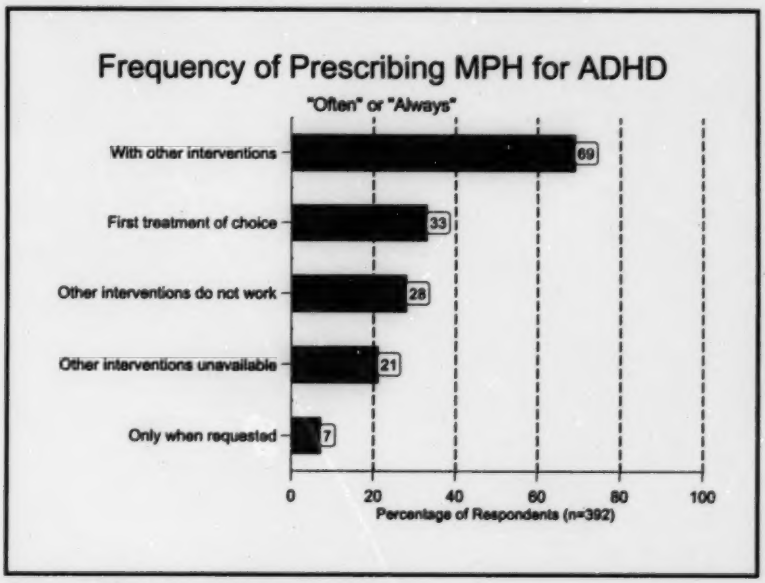

Figure 25: *Survey question 18.*

It was found that child psychiatrists were most likely to report often or always prescribing MPH routinely as the first treatment of choice (52% of child psychiatrists) and also in conjunction with other interventions (91% of child psychiatrists).

3.3.9 Amount of Time ADHD Patients are on MPH

As Figure 26 depicts, over three-quarters of all respondents who had seen patients for ADHD selected the category "one to five years" to indicate the average length of time patients with ADHD remain on MPH. (The categories provided to respondents are provided in Figure 26 along with an indication of the proportion of respondents who did not provide a response).

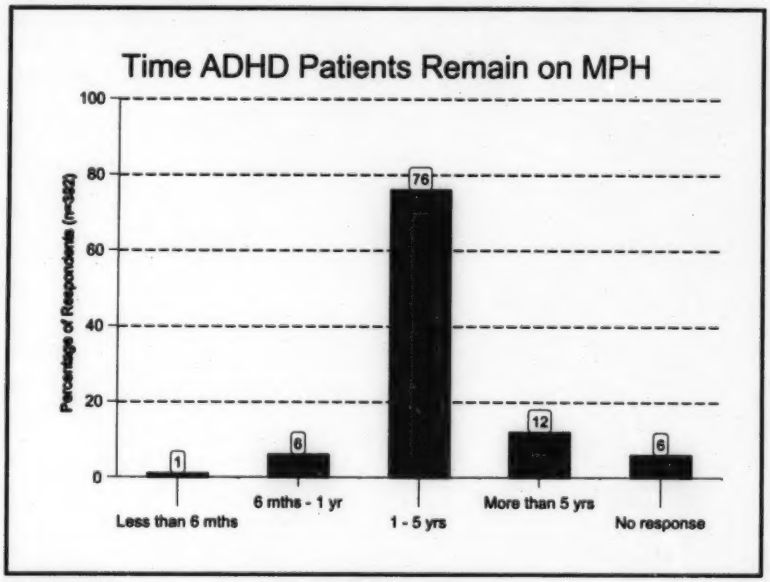

Figure 26: *Survey question 19.*

3.3.10 Pressure to Prescribe MPH

To examine the extent that physicians feel pressure from various sources to prescribe MPH, respondents who had seen patients for ADHD rated how often different agents were sources of pressure. These ratings are summarized in Figure 27. In general, respondents most often felt pressured to prescribe MPH by teachers, and to a lesser extent, parents. Respondents felt least pressured by legal problems or by employment concerns. "Other" sources of pressure, mentioned by respondents themselves, included nurses, other children, and school representatives.

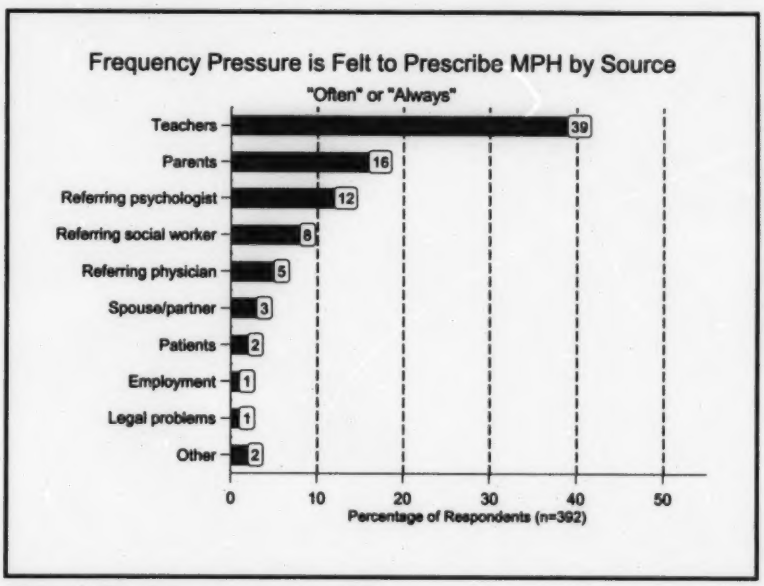

Figure 27: *Survey question 20.*

Pediatricians were less likely than other groups to feel pressured by employment concerns (only 1% of pediatricians reported sometimes feeling pressure). Child psychiatrists were more likely than other respondents to often or always feel pressured by teachers (24% of child psychiatrists) or patients (3% of child psychiatrists). General/family physicians most often reported feeling pressured by parents (27% of general/family physicians), but least often reported pressure from referring physicians (2% of general/family physicians) or social workers (6% of general/family physicians).

3.3.11 Reasons for Discontinuing MPH

Respondents' ratings indicated that only rarely did such factors as MPH ineffectiveness, side effects, worry about long term effects, eventual loss of effectiveness, trouble maintaining the medication routine, or cost affect patients' decisions to stop patients using MPH. (Items were provided for respondents to rate.)

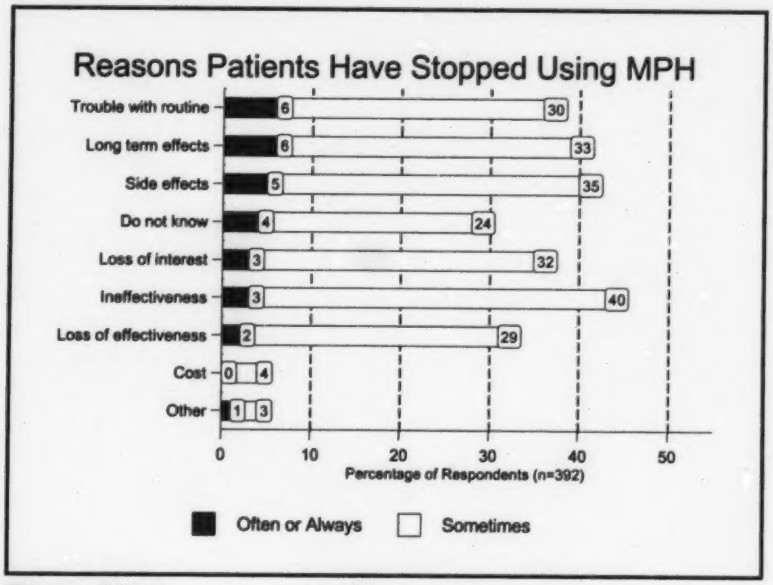

Figure 28: *Survey question 21.*

General/family physicians were least likely of the four target specialties to report that patients often or always stop using MPH because of side effects (4% of general/family physicians): child psychiatrists and developmental pediatricians were most likely to cite this as a reason were (7% of child psychiatrists and 11% of developmental pediatricians). Child psychiatrists were most likely to report that patients stop MPH because of problems maintaining the treatment routine (6% of child psychiatrists).

3.3.12 Methods of Monitoring ADHD Treatment

The most frequently used methods of monitoring patients' use of MPH for side effects are presented in Figure 29 (respondents were provided with options to be rated). Overall it can be seen that respondents rely on routine scheduled follow-up visits, asking parents or patients to call if side effects are experienced, and physical examinations to detect side effects with MPH use. Use of side effect rating scales is relatively infrequent. The most frequently used "other" method, mentioned by respondents on their own, was to monitor school records and reports.

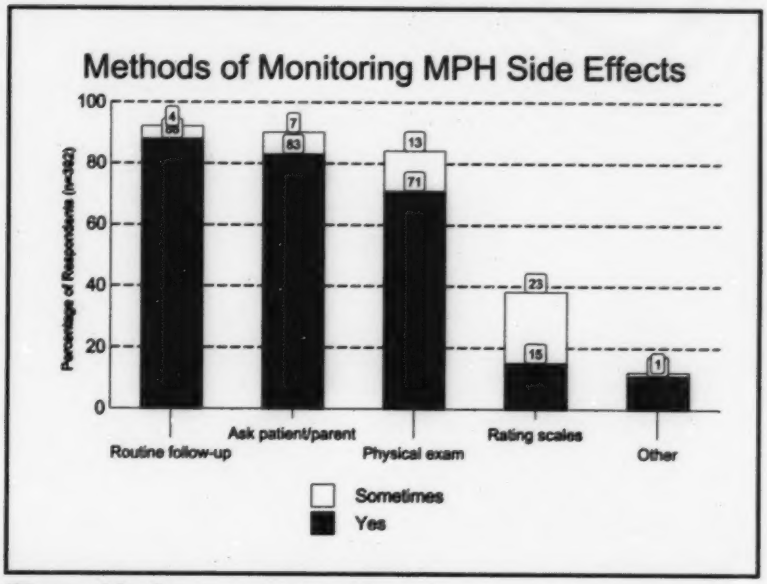

Figure 29: *Survey question 22.*

Analyses showed side effects rating scales were more often used by older respondents ($r = .15$) and those who had more experience in practice ($r = .14$). Side effects rating scales were also used more by developmental pediatricians (29% of developmental pediatricians) and child psychiatrists (25% of child psychiatrists) than other groups. Physical examinations, on the other hand, tended to be used by younger physicians ($r = -.15$) and those with fewer years of practice experience ($r = -.16$). Physical examinations were a method least used by developmental pediatricians (7% of developmental pediatricians).

To assess the efficacy of MPH as a treatment, the method rated by respondents as being used most frequently was to schedule appointments to review the treatment's progress (response categories were provided for respondents to rate). Next most frequent was to have patients contact the physician or to enquire at the patient's next general appointment. Least often used were placebo trials, daily report cards, or cognitive or psycho-educational tests.

One respondent made the point that the term "medication holiday" has several different uses in the medical realm. One meaning of the term is a controlled trial where effects of discontinuing the drug is carefully assessed. A second meaning of the term mediation holiday is simply time off because of inconvenience of continuing. These two definitions of the term are not differentiated in this survey.

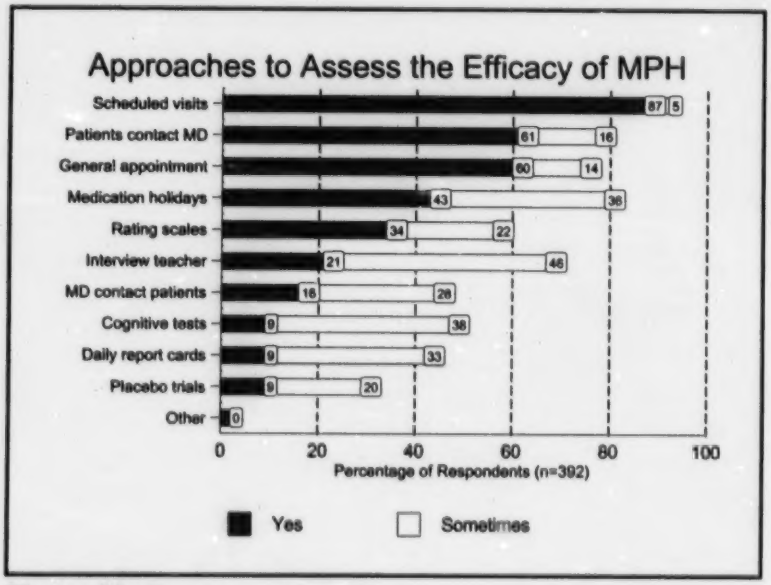

Figure 30: *Survey question 23.*

Overall, general/family physicians were the least likely of all specialty groups to have patients contact them (57% of general/family physicians), contact patients by telephone (10%), interviews with teachers or employers (13%), or use of cognitive or psycho-educational tests (7%). Developmental pediatricians, however, were most likely to use placebo trials (42% of developmental pediatricians), rating scales (84%), and use of daily report cards (22%), and medication holidays (67%).

When respondents were provided with an opportunity at the end of the survey to specify the kinds of help that would be most useful to them in working with patients with ADHD, the most frequent replies were as follows:

- continuing medical education (37% of respondents)
- the availability of information materials for physicians (27% of respondents)
- the availability of information materials for patients and parents (20% of respondents)
- more school resources and support programs (5% of respondents)
- consensus on all diagnostic and treatment options for ADHD (5% respondents)
- the availability of better diagnostic tools (4% of respondents)
- more access to other professionals (4% respondents)
- the establishment of multi-disciplinary treatment teams (3% respondents).

The questionnaire ended with an opportunity for respondents to express additional thoughts or concerns regarding the subject matter covered by the questionnaire. No substantial patterns were detected in these response, suggesting that the questionnaire was perceived to have adequately covered the issues.

4 Summary

It is important to note that the results of this survey represent the opinions and beliefs of a selected sample of physicians. As such, the results cannot necessarily be taken at face value as a description of actual behaviour of Canadian physicians regarding the diagnosis and treatment of ADHD and the use of MPH. What these results do represent is a picture of physicians' perceptions of the environment in which they practice, and the relative influence of various factors on their diagnosis and treatment of ADHD. With this cautioning, the following are some of the major conclusions arising from the results of this study.

4.1 How physicians diagnose Attention Deficit/Hyperactivity Disorder (ADHD)

The majority of physicians responding to this survey had seen patients for ADHD. All areas of specialty combined, physicians were seeing approximately 50 patients a year on average, with developmental pediatricians reporting the highest numbers of cases. Consistent with the literature on the subject, most patients diagnosed and treated for ADHD were males and between the ages of 5 and 12 years old. Teacher and parent concern were most often indicated as the reason that patients are presented for diagnosis.

Diagnosis of ADHD is primarily conducted using Standard Diagnostic Criteria or the DSM IV. Factors most considered in the diagnosis of ADHD are impairment at home, inattention, significant impairment, impulsiveness, the duration of the symptoms, hyperactivity, age of symptom onset, and family history. Methods of collecting information include interviews with patients and their families, observations in the physicians' office, physical examinations, reviews of academic records, and self-completed rating scales by the patients and their teachers. The average time to make a diagnosis of ADHD was estimated to be approximately an hour, and the time needed for administration an additional three-quarters of an hour.

However, despite the availability of these diagnostic instruments and established criteria, respondents (both those who do and those who do not see patients with ADHD) generally believe that they are not informed enough about ADHD, its diagnosis and treatment. Reactions were mixed on whether diagnostic criteria are vague, indicating that at least some physicians are not comfortable with ADHD diagnosis. Further, there is a general perception that problems exist in the diagnosis of ADHD and the use of MPH. Physicians believe there are insufficient professionals qualified to properly diagnose ADHD.

When it comes to referring patients to other professionals for diagnosis or treatment of ADHD, most physicians prefer to handle the case themselves. Respondents from three areas of specialty were most likely to conduct diagnosis and treatment of ADHD without referral to other professionals: developmental pediatricians; pediatricians; and child psychiatrists. Further, several regional differences were found in patterns of referral for both diagnosis and treatment.

4.2 How physicians treat ADHD

Overall, more than four out of five physicians who reported seeing patients for ADHD prescribed MPH as a treatment. Physicians indicated a belief that MPH is most effective when used in a multi-modal course of treatment. In general, MPH is perceived to be the treatment of choice for ADHD. Some reasons endorsed as explanations for increases in MPH use included: pressures to prescribe; increased public awareness of medication as an alternative; increased pressures to medicate medical conditions; too few resources for alternative approaches; increased acceptance of medication; and, a lack of discipline in homes and schools.

Other treatment alternatives recommended by physicians included verbal instruction, general support, liaison with schools or workplaces, provision of written information, and various therapies and training. Again, physicians indicated that MPH was best used in conjunction with these other approaches. When requested to indicate how long patients tend to continue on a programme of MPH, most physicians chose the category of one to five years.

4.3 Conditions under which physicians prescribe methylphenidate (MPH)

From their responses on the survey, physicians appear to have little concern about the use of MPH in terms of: long-term effects; side effects; gradual loss of effectiveness; and, bad publicity or the possibility of lawsuits. MPH tends to be used for a variety of disorders in addition to ADHD, with 27% of all physicians reporting that they use MPH for disorders other than ADHD and ADD.

As already mentioned, parents are a prime agent in bringing forward patients for ADHD diagnosis. Although physicians indicated that parents can sometimes be insistent in having ADHD diagnosed, and can also sometimes be resistant to an ADHD diagnosis, most of the time parents are willing to reasonably discuss the matter with physicians.

4.4 Influences and pressures physicians experience in prescribing MPH

Physicians indicated that pressure does exist to prescribe medications in general, and to prescribe MPH for ADHD in particular. This pressure was perceived as coming most often from teachers and parents. Another source of pressure was from other professionals such as psychologists and social workers. Pharmaceutical companies were not indicated to have much of a role in the perceived pressure to prescribe.

4.5 How physicians monitor medication use and regimen compliance

Physicians monitor treatment compliance and incidence of side effects or other problems largely through informal means. Most often monitoring was reported as scheduling routine follow-up visits, asking the patient and family, and using physical examinations. Very little use appeared to be made of standardized rating scales and other more formal criteria or procedures.

4.6 How physicians assess treatment efficacy

Assessment of ADHD treatment efficacy tended not to be rigorous for most physicians. Treatment efficacy was most often assessed by using scheduled visits to the physician, having the patient call the physician if problems are experienced, talking to patients during regular general appointments, and medication holidays. Less frequently used were more formal and pro-active procedures such as the physician contacting the patient on a regular basis as follow-up, formal placebo trials, daily report cards, and cognitive and psychological testing.

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Survey of Attention Deficit Hyperactivity Disorder (ADHD) Diagnosis and Treatment With Methylphenidate

We would like to find out more about your perspective on the treatment and diagnosis of ADHD and on your approach to prescribing methylphenidate. Please answer the following questions as candidly and honestly as possible. Your responses will be kept **confidential** and results of this survey will be reported only in aggregate form.

The intent of this survey is to understand the context and environments in which physicians practice. **Even if you do not prescribe methylphenidate, please complete the first and last portions of the questionnaire.**

PART 1: GENERAL PRACTICES AND ATTITUDES

1. a) **Have you ever seen patients for diagnosis or treatment of ADHD?**

☐ 1 Yes ☐ 2 No [*Go on to Question 2*]

b) **Have you ever prescribed methylphenidate for ADHD?**

☐ 1 Yes ☐ 2 No [*Go on to Question 2*]

c) **Do you currently have any patients on methylphenidate for ADHD?**

☐ 1 Yes [*Go on to Question 2*] ☐ 2 No

d) **If you have stopped prescribing methylphenidate for the treatment of ADHD, were any of the following reasons part of your decision to stop?**

i) No longer see ADHD patients	☐ 1 Yes	☐ 2 No
ii) Found it was ineffective	☐ 1 Yes	☐ 2 No
iii) Concern about side effects	☐ 1 Yes	☐ 2 No
iv) Concern about bad publicity/law suits	☐ 1 Yes	☐ 2 No
v) Use other stimulants instead [*please specify*]:_____ ...	☐ 1 Yes	☐ 2 No
vi) Use other treatments now	☐ 1 Yes	☐ 2 No

2. a) **Have you ever prescribed methylphenidate for disorders other than ADHD?**

☐ 1 Yes ☐ 2 No [*Go on to Question 4*]

b) For which of the following disorders have you prescribed methylphenidate?

☐ 1 Learning Problems ☐ 2 Narcolepsy ☐ 3 ADD (without hyperactivity)
☐ 4 AIDS ☐ 5 Depression ☐ 6 Conduct Disorder
☐ 8 Oppositional Disorder ☐ 9 Geriatric Disorders
*- Please specify:*_____
☐ 10 Other -*Please specify*: _____

3. **Have you used any of the following sources of information on ADHD in the past 12 months?**

a) Scientific journals	☐ 1 Yes	☐ 2 No
b) Patients	☐ 1 Yes	☐ 2 No
c) Colleagues	☐ 1 Yes	☐ 2 No
d) Professional workshops	☐ 1 Yes	☐ 2 No
e) Continuing medical education courses	☐ 1 Yes	☐ 2 No
f) Popular media	☐ 1 Yes	☐ 2 No
g) The Internet	☐ 1 Yes	☐ 2 No
h) Support group literature, e.g., Children and Adults with Attention Deficit Disorders (CHADD)	☐ 1 Yes	☐ 2 No

4. **The following set of statements are meant to assess your opinions about ADHD and its treatment. Please indicate on the scale provided the extent you agree or disagree with each of the following statements.**

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
a) ADHD is under-diagnosed	1	2	3	4	5
b) ADHD is usually accurately diagnosed	1	2	3	4	5
c) ADHD diagnostic criteria are too vague	1	2	3	4	5
d) Physicians are not well informed about standard diagnostic criteria	1	2	3	4	5
e) There are too few properly qualified diagnosticians for ADHD	1	2	3	4	5
f) Methylphenidate is appropriately prescribed ..	1	2	3	4	5
g) Physicians are under pressure to prescribe methylphenidate	1	2	3	4	5
h) Methylphenidate is the treatment of choice for ADHD	1	2	3	4	5

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
i) Methylphenidate is more effective when used as part of a multi-modal course of treatment for ADHD (e.g., including educational and psychosocial interventions, etc.)?	1	2	3	4	5

5. **In your experience, how has the use of methylphenidate changed since 1990, if at all?**

☐ 1 Increased ☐ 2 Stayed the same ☐ 3 Decreased

6. **It has been reported that use of methylphenidate has increased at the *national* level in the past several years. To what extent do you agree or disagree with the following statements as explanations for this increase in the consumption of methylphenidate in the treatment of ADHD?**

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
a) There is increasing public awareness of ADHD and its treatments	1	2	3	4	5
b) There is more evidence of methylphenidate efficacy	1	2	3	4	5
c) There is more evidence of methylphenidate safety .	1	2	3	4	5
d) Better diagnostic procedures are available for ADHD	1	2	3	4	5
e) Diagnostic procedures for ADHD are being used appropriately	1	2	3	4	5
f) There is more pressure from parents and teachers to use medications to treat ADHD	1	2	3	4	5
g) Patients do not have time for other treatments	1	2	3	4	5
h) There is a lack of structure and discipline at home and/or school	1	2	3	4	5
i) There is a increasing acceptance of medication as a treatment for ADHD	1	2	3	4	5
j) There is influence by the pharmaceutical companies to use medications	1	2	3	4	5
k) There are few resources for other interventions ..	1	2	3	4	5

7. **Do you have any comments on any of the topics covered in this part of the survey?**

_____

_____

PART 2: INDIVIDUAL PRACTICES AND ATTITUDES

If you have **not** seen patients in your practice for ADHD or related problems in the past 12 months, please go now to **Question 26 in PART 3** of the questionnaire.

8. a) **To the best of your ability, please estimate how many patients with ADHD you saw in your practice in the last 12 months?**_____

   b) **Of these patients, how many were being treated with methylphenidate?** _____

   c) **To the best of your ability, would you please estimate the number of patients in each of the following categories you saw about ADHD in the past 12 months?**

Gender:	Number of patients - newly diagnosed	Number of patients - treated with methylphenidate
Males		
Females		
TOTAL		

Age Group:	Number of patients - newly diagnosed	Number of patients - treated with methylphenidate
<5 years		
5-12 years		
13-18 years		
>18 years		
TOTAL		

9. **In your experience, how frequently do patients tend to present with ADHD because of each of the following?**

	Never	Rarely	Sometimes	Often	Always
a) Parent concern	1	2	3	4	5
b) Teacher concern	1	2	3	4	5
c) Patient's concern	1	2	3	4	5
d) Spouse/partner concern	1	2	3	4	5
e) Employment concern	1	2	3	4	5
f) Legal problems	1	2	3	4	5
g) Your own concern	1	2	3	4	5
h) Referral by physician	1	2	3	4	5
i) Referral by psychologist	1	2	3	4	5
j) Referral by social worker	1	2	3	4	5
k) Other [*specify below*] _____	1	2	3	4	5

10. **In your experience, how frequently do parents have the following reactions to the possibility that their child may have ADHD?**

	Never	Rarely	Sometimes	Often	Always
a) Insistent that their child has ADHD	1	2	3	4	5
b) Resistant that their child has ADHD	1	2	3	4	5
c) Comfortable discussing the possibility	1	2	3	4	5

11. **When managing a patient with ADHD, how frequently do you refer to one of the following professionals for a) diagnosis and b) treatment?**

	a) Diagnosis					b) Treatment				
	Never	Rarely	Sometimes	Often	Always	Never	Rarely	Sometimes	Often	Always
a) No referral, do assessment yourself	1	2	3	4	5	1	2	3	4	5
b) Pediatrician	1	2	3	4	5	1	2	3	4	5
c) Psychiatrist	1	2	3	4	5	1	2	3	4	5
d) Psychologist	1	2	3	4	5	1	2	3	4	5
e) Neurologist	1	2	3	4	5	1	2	3	4	5

f) Other [*specify*] _____	1	2	3	4	5	1	2	3	4	5

12. **When conducting an ADHD assessment how frequently do you use each of the following?**

	Never	Sometimes	Always
a) Standard diagnostic criteria	1	2	3
b) DSM III	1	2	3
c) DSM III-R	1	2	3
d) DSM IV	1	2	3
e) ICD-9	1	2	3
f) ICD-10	1	2	3
g) Other [*specify below*] _____	1	2	3

13. **To what extent do you agree or disagree that each of the following is important to the diagnosis of ADHD?**

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
a) Family History	1	2	3	4	5
b) Age of onset	1	2	3	4	5
c) Inattention symptoms	1	2	3	4	5
d) Hyperactivity symptoms	1	2	3	4	5
e) Impulsivity symptoms	1	2	3	4	5
f) Duration of symptoms	1	2	3	4	5
g) Clinically significant impairment	1	2	3	4	5
h) Impaired function at home, school, work etc.	1	2	3	4	5
i) Impaired function at the physician's office.	1	2	3	4	5

14. **Do you use the following for gathering diagnostic information when seeing a patient with potential ADHD?**

	Yes	Sometimes	No
a) Interview of patient and family.	1	2	3
b) Standardized diagnostic interview of patient/family, e.g. DICA (Diagnostic Interview for Child Assessment).	1	2	3
c) Interview with teacher.	1	2	3
d) Review of academic record.	1	2	3
e) Standardized behaviour rating scales self report.	1	2	3
f) Standardized behaviour rating scales completed by parents.	1	2	3
g) Standardized behaviour rating scales completed by teachers.	1	2	3
h) Behavioural observations in office.	1	2	3
i) Behavioural observations in school.	1	2	3
j) Intelligence testing.	1	2	3
k) Achievement testing.	1	2	3
l) Computerized attention test	1	2	3
m) Physical examination	1	2	3
n) Motor skill assessment	1	2	3
o) Speech/language assessment	1	2	3
p) Other [*specify below*] _____	1	2	3

15. **How much time do you typically take with a patient when your are diagnosing ADHD?**
_____**minutes**

16. **How much administrative time does the typical diagnosis take?** _____**minutes**
(This includes telephone calls to teachers, scoring questionnaires etc.)

17. **How often do you recommend the following interventions/treatments to your patients with ADHD?**

	Never	Rarely	Sometimes	Often	Always
a) Provision of verbal information	1	2	3	4	5
b) Provision of written material	1	2	3	4	5
c) General support	1	2	3	4	5
d) Liaison with school or employer	1	2	3	4	5
e) Methylphenidate	1	2	3	4	5
f) Dextroamphetamine	1	2	3	4	5
g) Pemoline.	1	2	3	4	5
h) Antidepressant	1	2	3	4	5
i) Clonidine	1	2	3	4	5
j) Other medication [*specify below*]: _____	1	2	3	4	5
k) Diet	1	2	3	4	5
l) Behaviour therapy	1	2	3	4	5
m) Parent training	1	2	3	4	5
n) Organizational skills training	1	2	3	4	5
o) Social skills training	1	2	3	4	5
p) Family therapy	1	2	3	4	5
q) Individual psychotherapy	1	2	3	4	5
r) Marital therapy	1	2	3	4	5
s) Educational intervention	1	2	3	4	5
t) Other [*specify below*] _____	1	2	3	4	5
u) two or more of the above (k-t) interventions in a multi-modal course of treatment	1	2	3	4	5

18. **How often do you prescribe methylphenidate for patients with ADHD in each of the following circumstances?**

	Never	Rarely	Sometimes	Often	Always
a) Routinely as the first treatment of choice .	1	2	3	4	5
b) Only when patients (parents) request it . . .	1	2	3	4	5
c) Only when other interventions do not work	1	2	3	4	5
d) When other interventions are unavailable .	1	2	3	4	5
e) In conjunction with other interventions .	1	2	3	4	5

19. **On average, how long do your patients with ADHD tend to remain on methylphenidate?**

- ☐ 1 Less than 6 months
- ☐ 2 Six months to a year
- ☐ 3 Between a year and five years
- ☐ 4 More than five years

20. **How often do you feel pressured to prescribe methylphenidate from the following sources?**

	Never	Rarely	Sometimes	Often	Always
a) Parent	1	2	3	4	5
b) Teacher	1	2	3	4	5
c) Patient	1	2	3	4	5
d) Spouse/partner	1	2	3	4	5
e) Employment concern	1	2	3	4	5
f) Legal problems	1	2	3	4	5
g) Referring physician	1	2	3	4	5
h) Referring psychologist	1	2	3	4	5
i) Referring social worker	1	2	3	4	5
j)Other [*specify below*] _____ . . .	1	2	3	4	5

21. **How often in the past 12 months did your patients stop using methylphenidate for the following reasons?**

	Never	Rarely	Sometimes	Often	Always
a) Side effects	1	2	3	4	5
b) Loss of interest	1	2	3	4	5
c) Ineffectiveness	1	2	3	4	5
d) Worry about long term effects	1	2	3	4	5
e) Eventual loss of effectiveness	1	2	3	4	5
f) Trouble maintaining routine	1	2	3	4	5
g) Do not know the reason	1	2	3	4	5
h) Cost	1	2	3	4	5
i) Other [*specify below*] _____	1	2	3	4	5

22. **Do you use the following to monitor methylphenidate side effects?**

	Yes	Sometimes	No
a) Asking parents/patients to call if side effects are experienced	1	2	3
b) Scheduling routine follow –up visits	1	2	3
c) Using side effects rating scales	1	2	3
d) Physical exams (height, weight)	1	2	3
e) Other [*specify below*] _____	1	2	3

23. **Do you use the following approaches to assess the efficacy of methylphenidate?**

	Yes	Sometimes	No
a) Have patients contact you	1	2	3
b) Contact patients by telephone	1	2	3
c) Schedule appointments to review progress	1	2	3
d) Inquire at next general appointment	1	2	3
e) Use placebo trials	1	2	3
f) Use rating scales	1	2	3
g) Use daily report cards	1	2	3
h) Interview teacher/ employer	1	2	3
i) Use cognitive or psycho- educational tests	1	2	3
j) Medication holidays	1	2	3
k) Other [*specify below*] _____	1	2	3

24. **What kind of help would be most useful to you as a physician working with patients with ADHD? (e.g., informational material, continuing education on this topic, etc.)**

_____

_____

_____

25. **Do you have any other comments about anything that was covered in this survey?**

_____

_____

_____

_____

PART 3: BACKGROUND INFORMATION

The information in this final section is for statistical analysis purpose and will only be reported in aggregate fashion. All of your results will remain confidential.

26. What is your age? _____

27. Gender: ☐ 1 Female ☐ 2 Male

28. University Conferring Medical Degree: _____ 29. Year: _____

30. Specialty: _____ 31. Years in Practice: _____

32. Practice Setting:

☐ 1 children's hospital ☐ 2 university teaching hospital ☐ 3 other hospital
☐ 4 community health centre ☐ 5 private solo practice ☐ 6 private group practice
☐ 7 other, specify: _____

33. When did you start practising? 19 _____

Thank you for taking the time to respond to this survey on an important topic to physicians in Canada. Please enclose your completed questionnaire in the pre-addressed business-class envelope and return it to:

GPC Factor Research Group
220 Laurier Ave. W., Suite 1650
Ottawa, Ontario
K1P 5Z9

or by fax to
(613) 236-9867

Don't forget to put your name on the **accompanying postcard** and return it separately in the mail so that we do not contact you in the future to remind you to complete the survey. Thank you again.